FE Special Report . . .

Liquid Level Control—p. 57

FEBRUARY 1961

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FOOD ENGINEERING

BETTER MANAGEMENT IN MANUFACTURING, PACKAGING, MARKETING

A CHILTON PUBLICATION

BIGGER PRIVATE LABEL THREAT

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FEWER TRADE BUYERS

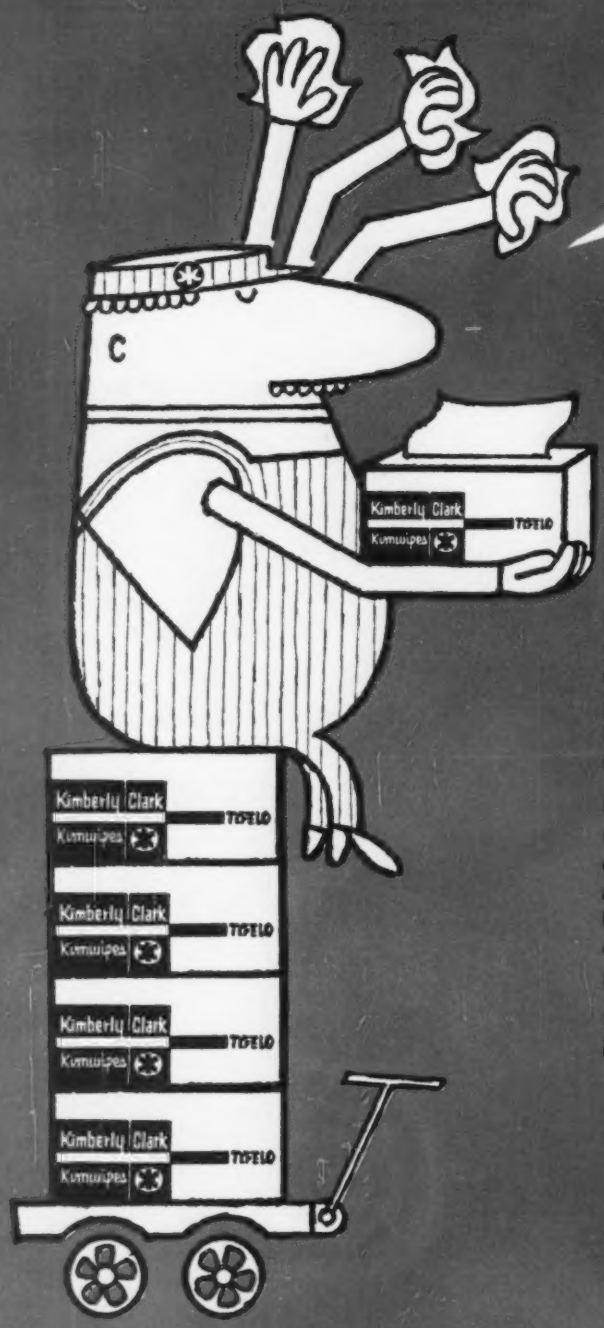
WEAKER SELLING FORCE

STRONGER NON-FOOD COMPETITION

GREATER DEMAND FOR SERVICES

CHALLENGES OF THE DECADE

PAGE 34



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BETTER MANAGEMENT IN MANUFACTURING, PACKAGING, MARKETING

A CHILTON PUBLICATION
VOL. 33 NO. 2

February, 1961

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If permitted, it will revolutionize beer production, marketing.

SPECIAL FE REPORT

Today's profit squeeze leaves you little margin for error in process and inventory control. Here are ways to minimize those 'indeterminate' losses in liquid raw materials and products. —p. 57.

NEW IMPROVED

Votator® SCRAPED SURFACE HEAT TRANSFER UNITS

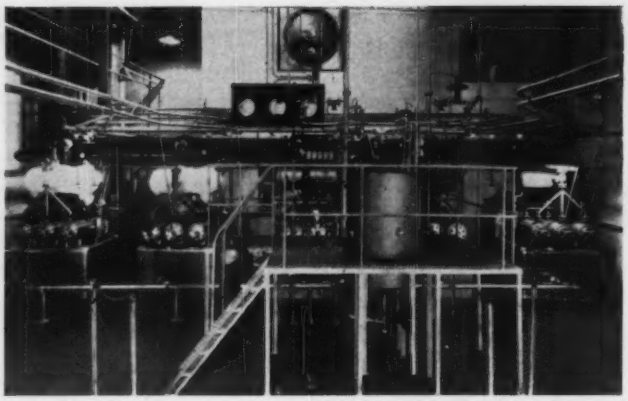
make tough jobs easier . . . more profitable

Really tough jobs which until now could not be handled in continuous systems are easy—like the precooling, seeding, crystallization and dispersion of honey at a temperature below 60°F. and the freezing of ice cream and ice milk to 17°F. Yes, very high viscosities can be processed now. Remember, if it can be pumped, it can usually be processed with better results in VOTATOR processing equipment.

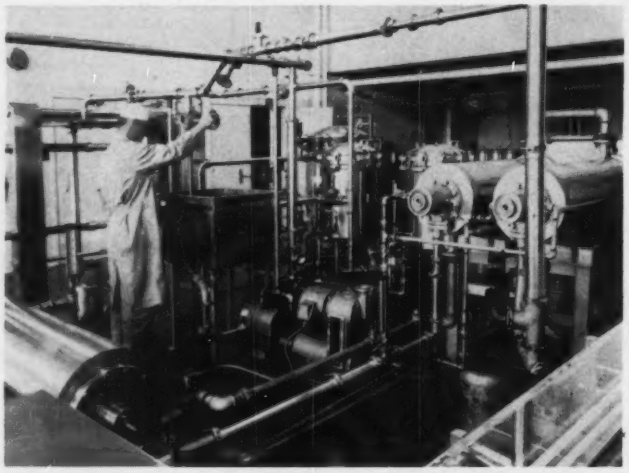
New concepts in VOTATOR designs offer greater advantages to food processors. Increased thruputs are now obtained when processing viscous materials and high solids slurries. Higher production per unit means valuable building space savings. In the new VOTATOR equipment lower power input makes more efficient use of heating or cooling mediums. Jobs like the cooling and homogenizing of peanut butter, the chilling and extrusion of gelatin and the cooking and cooling of starch paste for salad dressings are done better at less cost in VOTATOR continuous processing equipment.

VOTATOR processing systems provide the time-saving and labor-saving advantages of sanitary, closed, continuous processing. Precise control possible with VOTATOR equipment further assures top quality and uniformity.

Rugged, dependable VOTATOR equipment is fabricated by skilled craftsmen in strict compliance with ASME codes. A continuous research and development program to assure you of the most up-to-date equipment design for your requirements is in operation.



Continuous slush freezing of citrus concentrate with VOTATOR Equipment at Minute Maid, Plymouth, Florida.



Continuous crystallization of honey with VOTATOR Equipment at Manitoba Cooperative Honey Producers Ltd., Manitoba, Canada.

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VOTATOR HEAT TRANSFER DATA BOOK PED238

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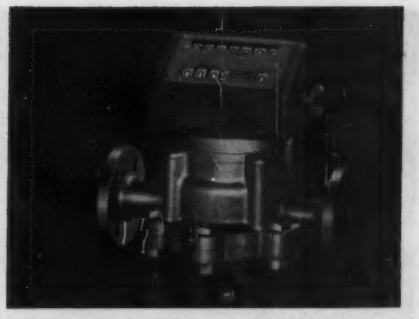
NIAGARA METERS



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Leading companies in the Food Industry use NIAGARA meters in batching and processing operations to measure and control flow of liquid ingredients. Metering assures uniform quality, provides inventory controls, speeds operations, and reduces operating costs.

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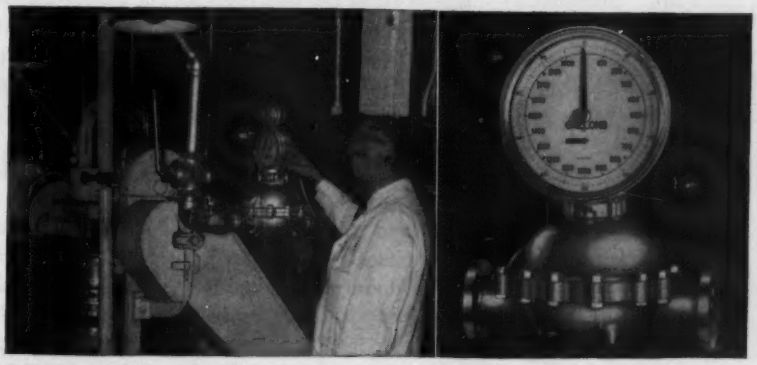

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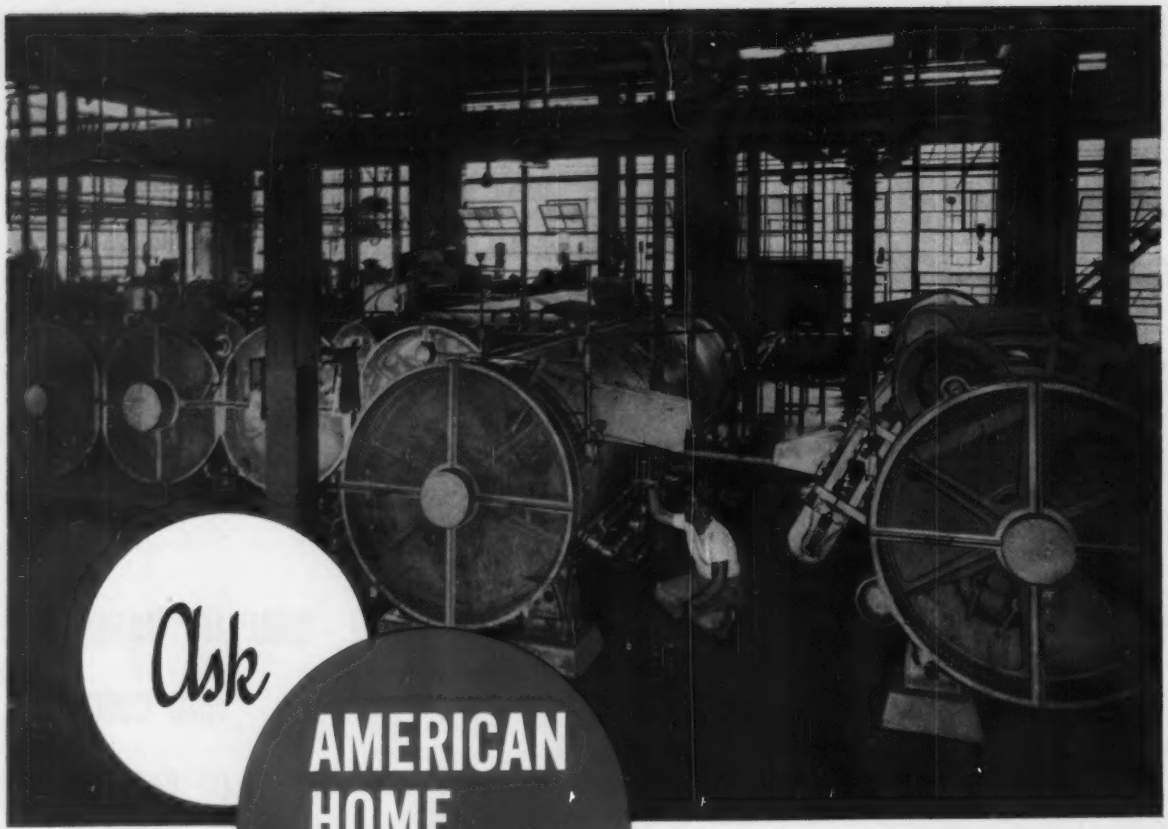

Ask AMERICAN HOME FOODS

There is no surer way to decide whether an FMC "Sterilmatic"* line is *right* for you than to ask leading food processors who are now using these continuous pressure cookers and coolers.

Ask American Home Foods, Division of American Home Products Corp., for example. They installed their first "Sterilmatic" in 1946 in their Chef-Boy-ar-Dee plant at Milton, Pa.

During the years since then, they have specified "Sterilmatic" three times – now have 7 of these lines in the plant, turning out the 53 foods they pack under the famous Chef's label.

You will learn that "Sterilmatic" pioneered a new concept in food processing – one that invariably cuts processing time, assures uniform quality, helps preserve natural color, flavor, texture and nutrients, and minimizes can damage.

The list of "Sterilmatic" users reads like a Blue Book of food processors. Let their use-experience be your guide to better, more profitable food processing.

A 16-page brochure, "The Sterilmatic Story," gives full details and is yours for the asking. Write for it – today.

*FMC "Sterilmatic" Continuous Pressure Cooker and Cooler – Trade Mark – Reg. U. S. Pat. Off.

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TRENDS & FORECASTS

Gross national product of $512 billion in '61 is forecast by one expert, $521 billion by another. For '60, gnp was record $503 billion. Looking decade ahead, $780 billion gnp is foreseen.

Consumers are confident, savings high, potential spending great. Challenge to food manufacturers—sell more quality and convenience.

Expenditures for food and beverages hit $81.4 billion annual rate in 3rd quarter of '60, 4% above '59. One-fourth of consumer spending and 33% of retail sales are for food and drink.

Employment in food and beverage industries is 1.5 million, 66% production workers. Industry accounts for 9% of all factory employment.

Food industry spends 40% of national advertising dollars.

Production gains in '60: Meat products, 3%; dairy, 1% bakery, 1%; sugar, 5%; confectionery, 2%; soft drinks, 3½%; potato chips, 7%; fats and oils, record level; coffee roasting, up slightly.

Canned food gains in '60: green beans, 8.15%; wax beans, 12.6%; tomato puree, 23.7%; tomato sauce, 18.6%; California tomato paste, 20%; catsup, 31.2%; tomatoes, 6.8%; tomato juice, 5.75%; pumpkin and squash, 11.8%; lima beans, 14.5%. Chili sauce lost 10.8%

Butter dropped in '60 to 7.8 lb. per capita. Margarine rose to 9.6 lb. Combined consumption is below prewar years.

Total milk fat used per person is down to 25 lb. compared with 32 prewar. Keen competition between vegetable oils and milk fat in dairy products other than butter is forecast by USDA.

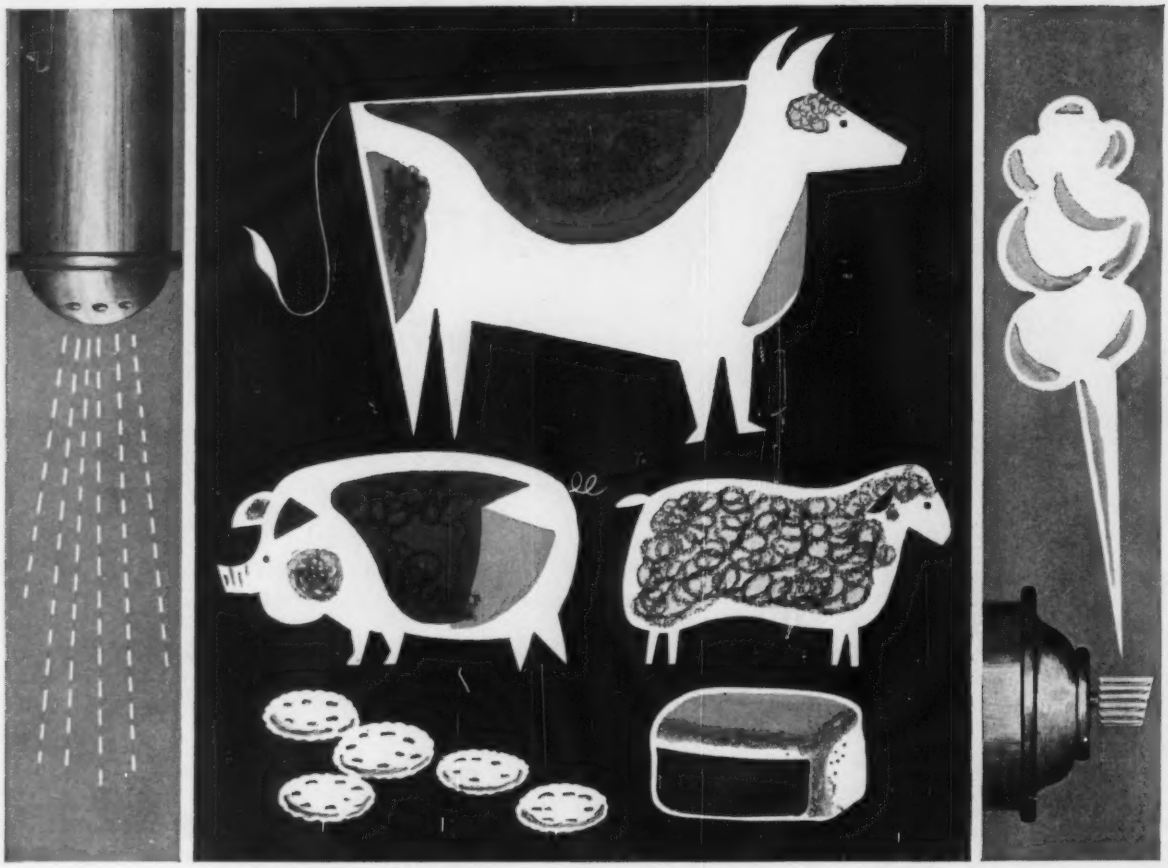
Per capita consumption of all dairy products in terms of milk equivalent dropped to a record low of 670 lb. in '60, compared to 678 in '59, and 802 in '35-39.

World agricultural production will be up 2% in '60-61, 42% above '35-39 average, USDA predicts. Production per capita is expected to be less in Russia, Far East, Latin America, and Eastern Europe.

U. S. exports of farm products in '60 set new volume record. Index hit 182, 4% above previous high in '57.

Indicator of great opportunity for sales of U. S. quality and convenience foods is 83% increase between '50 and '58 in gnp for Western Europe, United Kingdom, Australia, New Zealand, and Canada. Gnp increased 55% in U. S.

See Developments to Watch p. 13



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Since RHOZYME proteolytic enzymes are microbiological products, they can be made to a variety of specifications and allow adaptability not afforded by enzymes from plant and animal sources.

For example, RHOZYME P-11 is tailored for optimum effectiveness in meat tenderizing formulations. Rohm & Haas offers basic formulas for both liquid and powder tenderizers. The liquids are ideal for packaging in aerosol spray dispensers. Rohm & Haas has done considerable research to provide good shelf stability to aerosol packaged tenderizers and makes the information available to you. RHOZYME P-11 has been approved by the Meat Inspection Division of USDA for use as a tenderizer in treating meat cuts.

Other RHOZYME proteolytic enzymes are designed for applications such as modifying whey protein for cheese spreads; acting as substitutes for rennet in making cottage cheese; improving quality of bread, crackers, cookies; making protein hydrolyzates for diet foods, cereals, pharmaceuticals.

Write to Dept. SP-16 for enzyme samples, information on aerosol tenderizers, and suggestions for additional uses of proteolytic enzymes in food processing.

ROHM & HAAS

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Schedule of Events

February

10-12—Institute of American Poultry Industry, 32nd annual fact finding conference, Municipal Aud., Kansas City, Mo.

12-15—Air Conditioning & Refrigeration Institute, exposition, Los Angeles.

16—Dairy Products Improvement Institute, Inc., meeting, Hotel Gov. Clinton, NYC.

23-24—6th Annual Materials Handling & Packaging Conference, Cow Palace, San Francisco.

March

5- 8—Nat'l Assn. of Frozen Food Packers, meeting, Dallas, Tex.

6- 9—American Society of Bakery Engineers, meeting, Edgewater Beach Hotel, Chicago.

7- 8—Packaging Assn. of Canada, national conference, King Edward Sheraton Hotel, Toronto.

9-10—Dairy Suppliers Equippers, meeting, Barbizon Plaza Hotel, NYC.

12-15—Nat'l American Wholesale Grocers' Assn., meeting, Palmer House, Chicago.

20-23—15th Nat'l Conference on Handling Perishable Agricultural Commodities, Purdue Univ., Lafayette, Ind.

26-30—Nat'l Assn. of Refrigerated Warehouses & The Refrigeration Research Foundation, joint meeting, San Francisco.

HORS D'OEUVRES

In a newspaper story about the Army's quick bread, UPI described it as "an almost instant, near bread." How accurate can you get!

USDA has experimentally effected self-annihilation of house flies through chemical sterilization. The flies live and mate normally. Painless eradication.

Grocers of Sonoma County, Calif., offered price specials on foods for emergency shelters on Civil Defense Day. So someone finally awakened to this opportunity!

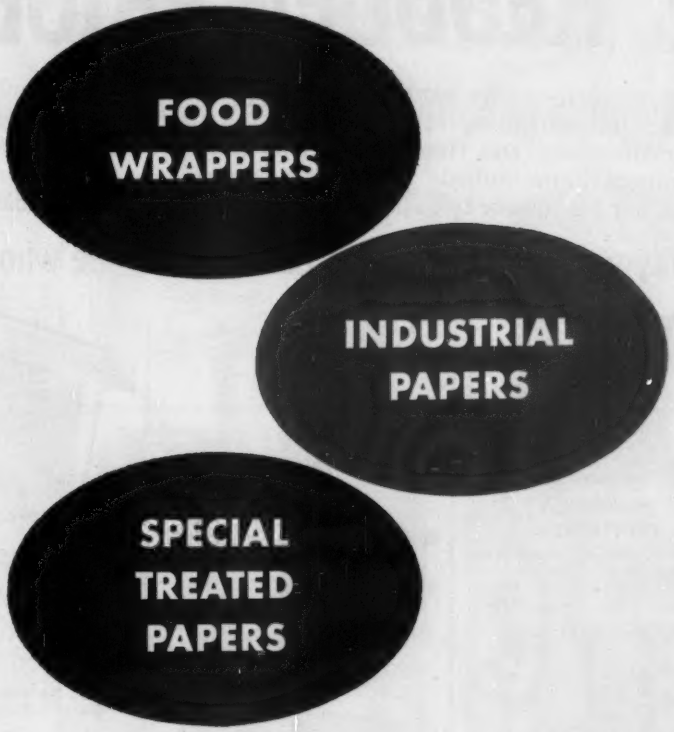
Training in civil defense will be given at annual meeting of American Association of Cereal Chemists in Dallas. Comes a nuclear attack, someone will have to decide what foods are safe to eat, and when. Who else but unprepared food scientists?

Cereal chemists are said to be selling their profession short, and youngsters are not entering this branch of food science in sufficient numbers. 'Tis par for the food profession course. Such modesty is quite unbecoming.

Automation has cut accidents in handling materials and in feeding machines. But it has increased hazards in mental health, says one expert. Apparently machine operators with nothing to do can go nuts.

Peanuts are blanched, or deskinned, manually at $15 per 100 lb. bag by poor southern families. After nuts are dipped in hot water, skins are rubbed off between forefinger and thumb. Hardly processing to be proud of.

If you're looking for quality in...



...look for this quality seal!

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*Trade Name of Aluminum Company of America

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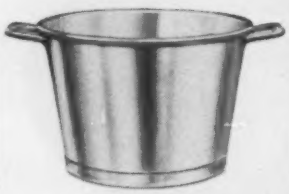
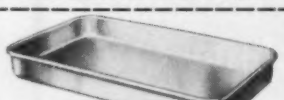
Cat. No. 5249 Cap. 16 Qts.
Cat. No. 5250 Cap. 21 Qts.



TUBS

Cat. No. 5217 Cap. 40 Qts.
Cat. No. 5218½ Cap. 36 Qts.
Cat. No. 5219½ Cap. 65 Qts.
Cat. No. 5417½ Cap. 56 Qts.

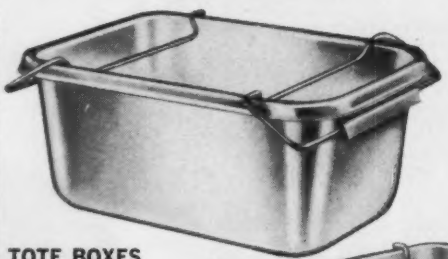


UTILITY TOTE PAN Cat. No. 4489
Size Top Outside 29¹³⁄₁₆" x 17²³⁄₆₄"

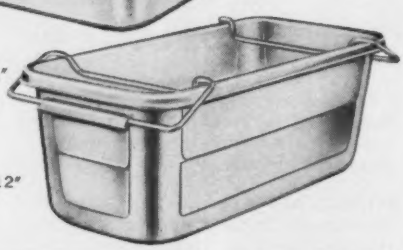
STACKING TOTE PAN
Cat. No. 4504
Inside Dimensions
20⅜" x 15⅜" x 4⅜"

ICING BOWLS

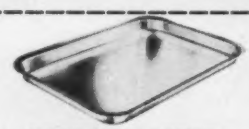
Cat. No. 5242 Cap. 4 Qts.
Cat. No. 5244 Cap. 6½ Qts.
Cat. No. 5245 Cap. 11 Qts.
Cat. No. 5246 Cap. 19 Qts.



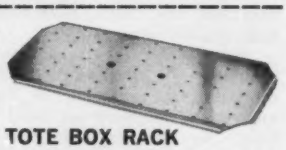
TOTE BOXES
Cat. No. 4502
23⅞" x 17¹⁄₁₆" x 10⅜"



Cat. No. 4500
34¹⁄₁₆" x 16⅞" x 12"



TOTE BOX COVER
Cat. No. 4502C 15⅞" x 21¼"



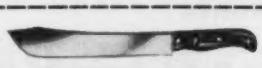
TOTE BOX RACK
Cat. No. 4497 10⅛" x 28⅝" x ⅝"

TOTE BOX DOLLIES
Cat. No. 4498 21" x 13⅜" x 5"
Cat. No. 4499 30¼" x 11¾" x 5"

STIRRING PADDLES
Cat. No. 5729 —45" Overall Length
Cat. No. 5756 —53" Overall Length

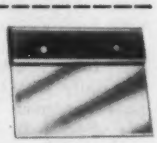
FROSTING SPATULA
Cat. No. 6606S Blade 6½" x 1½"

BONING KNIFE
Cat. No. 6418SC Blade length 6"



BUTCHER KNIFE
Cat. No. 6448 Blade length 8"

DOUGH CUTTER



Cat. No. 6214SR Blade 6"x 3"

THE BOARD-UNTIL MARCH 31

WEAR-EVER Aluminum food and materials handling equipment

UNDERCOUNTER BINS

Cat. No. 5500 Cap. 38 Gals.
Cat. No. 5524 Cap. 30 Gals.
Cat. No. 5528 Cap. 27 Gals.

DRUMS

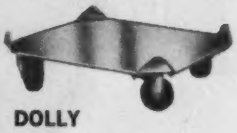
Cat. No. 5530 Cap. 30 Gals.
Cat. No. 5530½ Cap. 30 Gals.
Cat. No. 5550 Cap. 50 Gals.

SLIP-OVER TYPE DRUM COVERS

Cat. No. 5552 —Fits 50-Gal. Drum
Cat. No. 5532 —Fits 30-Gal. Drum

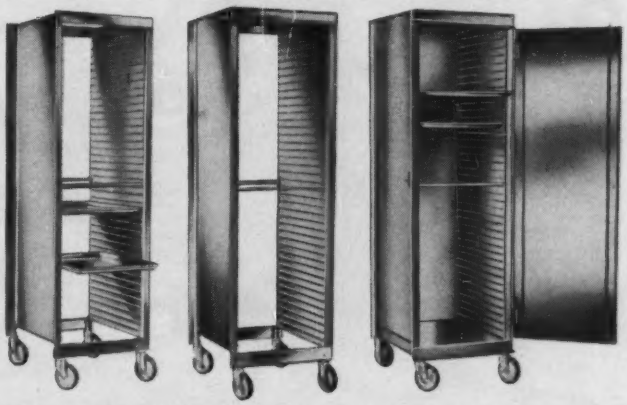
HINGED TYPE COVER

Cat. No. 5551— Fits 50-Gal. Drum
Cat. No. 5531— Fits 30-Gal. Drum



DOLLY

Cat. No. 5539— For No. 5530 and 5530½ Drum
Cat. No. 5540— For No. 5550 Drum

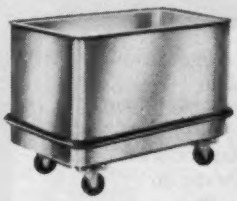


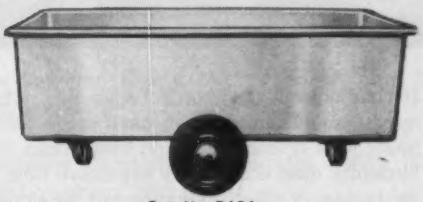
PORTABLE RACKS All 71⅞" x 20⅝", hold No. 5300 series pans

Cat. No. 5910 26⅝" Depth, 40 pans
Cat. No. 5912 (Closed) 27⅜" Depth, 39 pans
Cat. No. 5911 26$^{11}/_{16}$" Depth, 39 pans

TRUCKS

Cat. No. 5462
29" x 17¼" x 21"
Cap. 4.33 Cu. Ft., 225 Lbs.





Cat. No. 5464
63⅛" x 29⅛" x 25" Cap. 14 Cu. Ft., 1000 Lbs.

Cat. No. 5465
Cap. 1000 Lbs.
47" x 23"

Order today! Call your Wear-Ever representative for full details; or fill out and mail coupon below.

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Food Service Equipment Division
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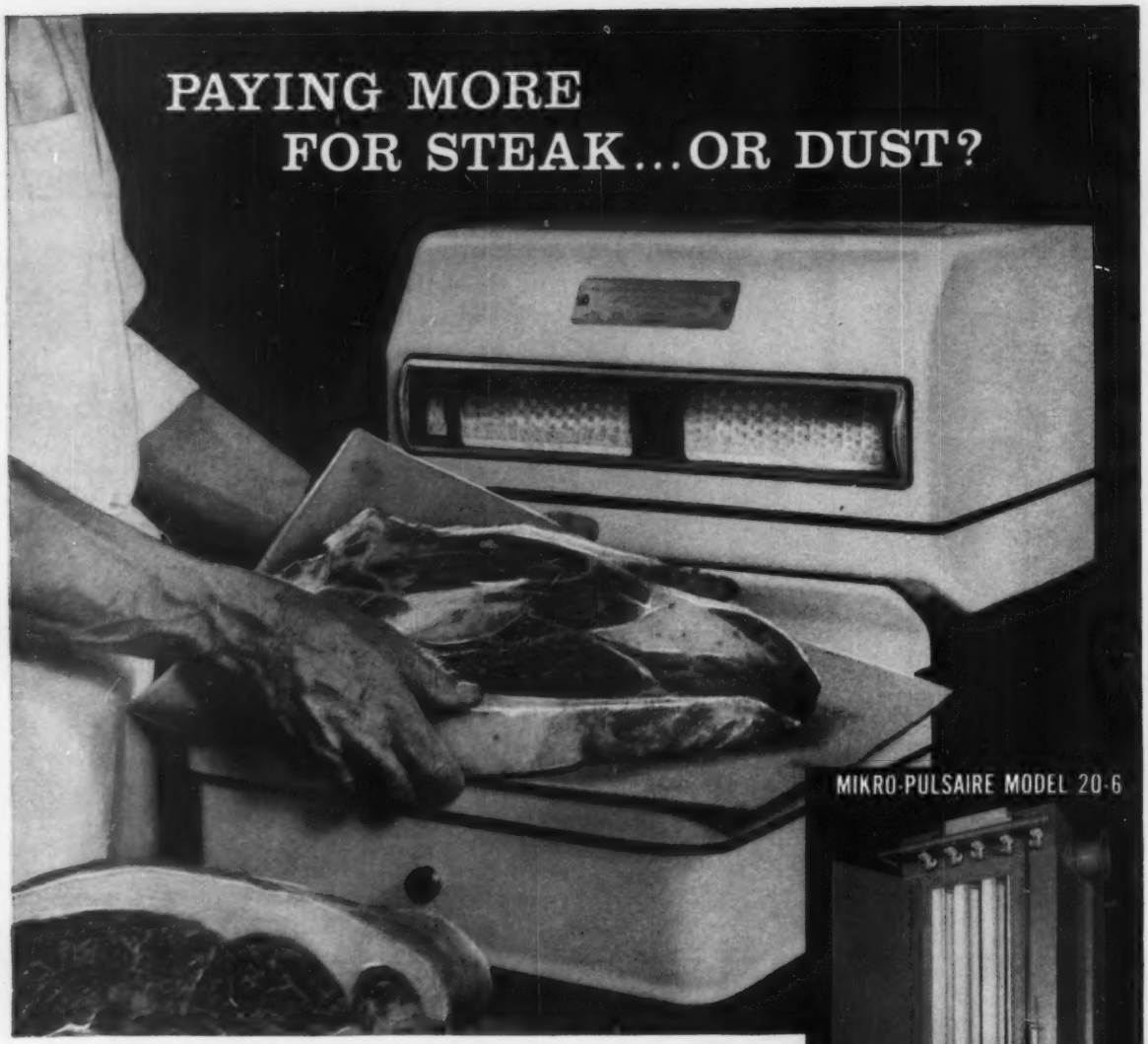
PAYING MORE FOR STEAK...OR DUST?



MIKRO-PULSAIRE MODEL 20-6

If your present dust control system is not delivering maximum efficiency, unchecked waste dust may be costing you more, on a pound for pound basis, than the finest cut of steak. Nuisance dust is a mighty expensive item when you consider its damaging effect on equipment, on employee morale, on general plant appearance and community relations. The most practical and economical solution of any nuisance dust problem is the MIKRO-PULSAIRE Collector, now available in new flexible modular units designed to meet any required capacity however large or small . . . attested recovery efficiency 99.9% plus . . . absolutely no moving parts, internally or in the gas stream . . . 4 or 5 times the capacity of conventional bag houses per unit of cloth area. For the toughest dust collection jobs – call on our engineering staff, and the MIKRO-PULSAIRE. Ask for Bulletin 52A-1.

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MANUFACTURING FACILITIES: United States, Canada, Continental Europe, British Isles.

DEVELOPMENTS TO WATCH

New bill permits FDA to postpone effective date of Additives Amendment where proponent of additive has been working diligently to establish safety. Laggards may get no extension beyond March 6.

Process for freeze-concentrating beer has been developed by Union Carbide. Could cut shipping costs by reconstitution at local plants. Development threatens small brewer.

Meat is tenderized by comminuting into extremely thin slices in new process. When slices are stacked, product closely resembles original meat in appearance. Technique is in experimental stage.

Lemon juice prevents browning and improves taste of French-fries, Sunkist reports. Acid apparently converts some starch to sugar. Apple browning is prevented by immersion in 25% lemon juice solution.

Enzyme activity can be physically measured by thiolated gelatin after cross-linking with mild oxidant to form rigid gels. Proteolytic enzymes hydrolyze surface at even rate.

Statistical quality control technique developed by USDA offers better way to control amount of fruit per can. Inspector samples cans before syrup is added.

Additive sprays over solids flowing thinly over cone in new unit. Adds flavor to instant coffee, moisture to instant milk.

New Heinz cheese soup contains Cheddar, whole-milk solids, flour, flavor, seasoning. Used directly or as ingredient.

Frozen whipped cream was liked in tests at Michigan Agricultural Experiment Station. Frozen toppings are on market.

New low-density polyethylene food packaging film has been developed by Eastman. Has high impact strength at low temperatures, strong tear resistance, good optical quality.

See Who's Building What p. 17

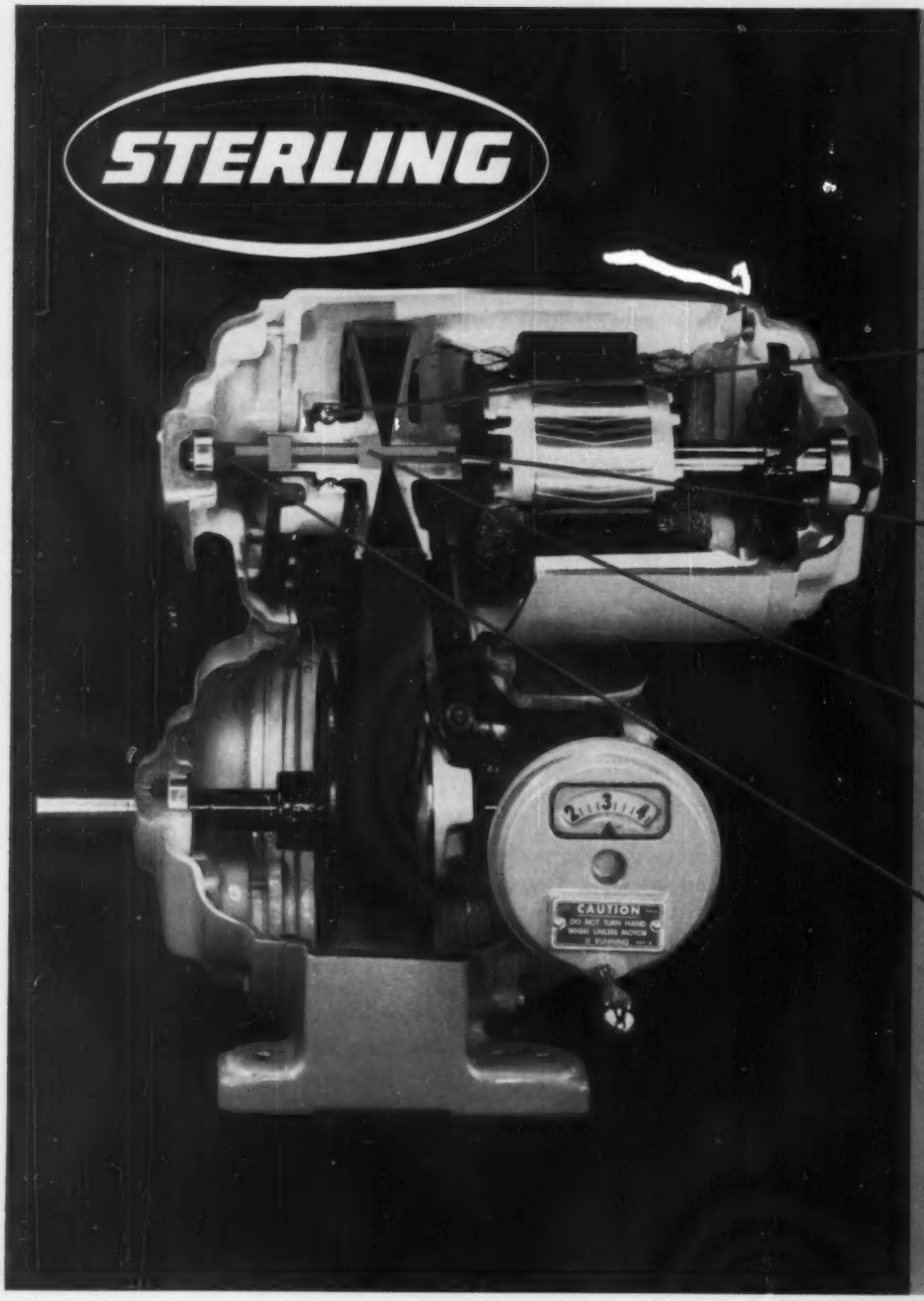
Silicone releasing agents look promising for packaging butter and other fatty foods. Petition filed with FDA seeks clearance.

Committee of scientists will advise AEC on radiation processing of foods. Chairman is S. A. Goldblith, MIT.

Washington Report p. 21

Woodard, new blueberry variety that will grow in deep South, is available. Seed of two new disease resistant soybean varieties, Kent and Bethel, will be released in spring by USDA.

new-lube-free....



Sealed and shielded bearings require no lubrication.

Keys are fabricated from tough elastic material to eliminate key and keyway wear.

Wear-resistant non-metallic bushings require no lubrication.

Shaft surfaces are corrosion-proof and require no lubrication.

...Sterling's variable speed drive never requires lubrication

Costs Reduced—One of management's biggest headaches has been the development and maintenance of proper lubrication schedules. As a consequence, lubrication problems have long been the cause of variable speed drive failures, pulley wear, sticky pulleys, shortened belt life, excessive noise, and many other equally costly problems.

High labor costs, coupled with increased maintenance needs, are major management problems.

Lubrication Eliminated—Now, Sterling has eliminated all lubrication maintenance problems. No part of a Sterling variable speed drive needs to be lubricated.

All bearings, sealed and shielded, are factory-lubricated and therefore require no lubrication. Shaft surfaces are impregnated with a special exceptionally tough and wear-resistant material which eliminates need for lubrication. The non-metallic bushings are also fabricated from a special material that is equally wear-resistant.

Special Load-Bearing Surfaces—At no time do these surfaces require any attention. Even the keys are fabricated from a tough elastic material and will not wear out.

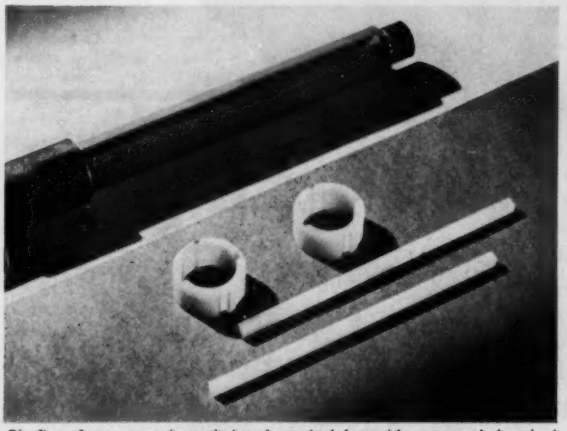
Fret corrosion, long a problem with metallic load-bearing surfaces, is completely eliminated since non-metallic surfaces now carry the load. Sticky pulleys, frequently the result of improper lubrication, are no longer a problem.

Sterling's new "Lube-Free" variable speed drive can be installed in any location, no matter how inaccessible, since lubrication maintenance is no longer needed.

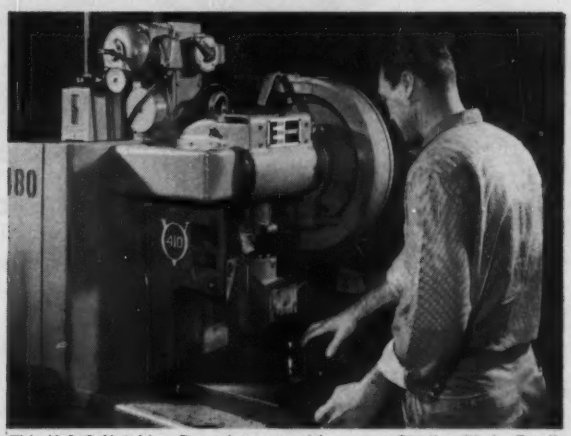
Other Benefits—Costs are reduced, money saved, when lubrication maintenance is no longer necessary. Belt life is lengthened; pulley wear is eliminated. Bearing life may also be lengthened by the elimination of worn pulleys—often the cause of vibration and bearing wear.

All other Sterling variable speed advantages are present in this new "Lube-Free" drive: wide range of speeds, heavy duty cast iron case, finger-tip speed control, etc.

Information Available—Complete application and product information is available by writing Dept. B-2, Sterling Electric Motors, Inc., 5401 Telegraph Road, Los Angeles 22, California—or by contacting the Sterling field engineer in your area.



Shaft surfaces are extremely tough; material provides unusual chemical resistance and anti-frictional properties that make an excellent load-bearing material operating under extremely low or high temperatures. Keys and bushings are fabricated from a material proven to have outstanding abrasion resistance; holds up indefinitely under frictional conditions, thus eliminating need for lubrication.



This V & O Notching Press is powered by a new Sterling "Lube-Free" variable speed drive. It will never need lubrication. Similar units have been installed in the food processing industry. The elimination of lubrication is particularly important in the food processing industry where variable speed drives have such wide application, and where oil and grease create sanitation problems.

Hathaway INSTRUMENTS INC

Sterling Electric Motors, Inc.

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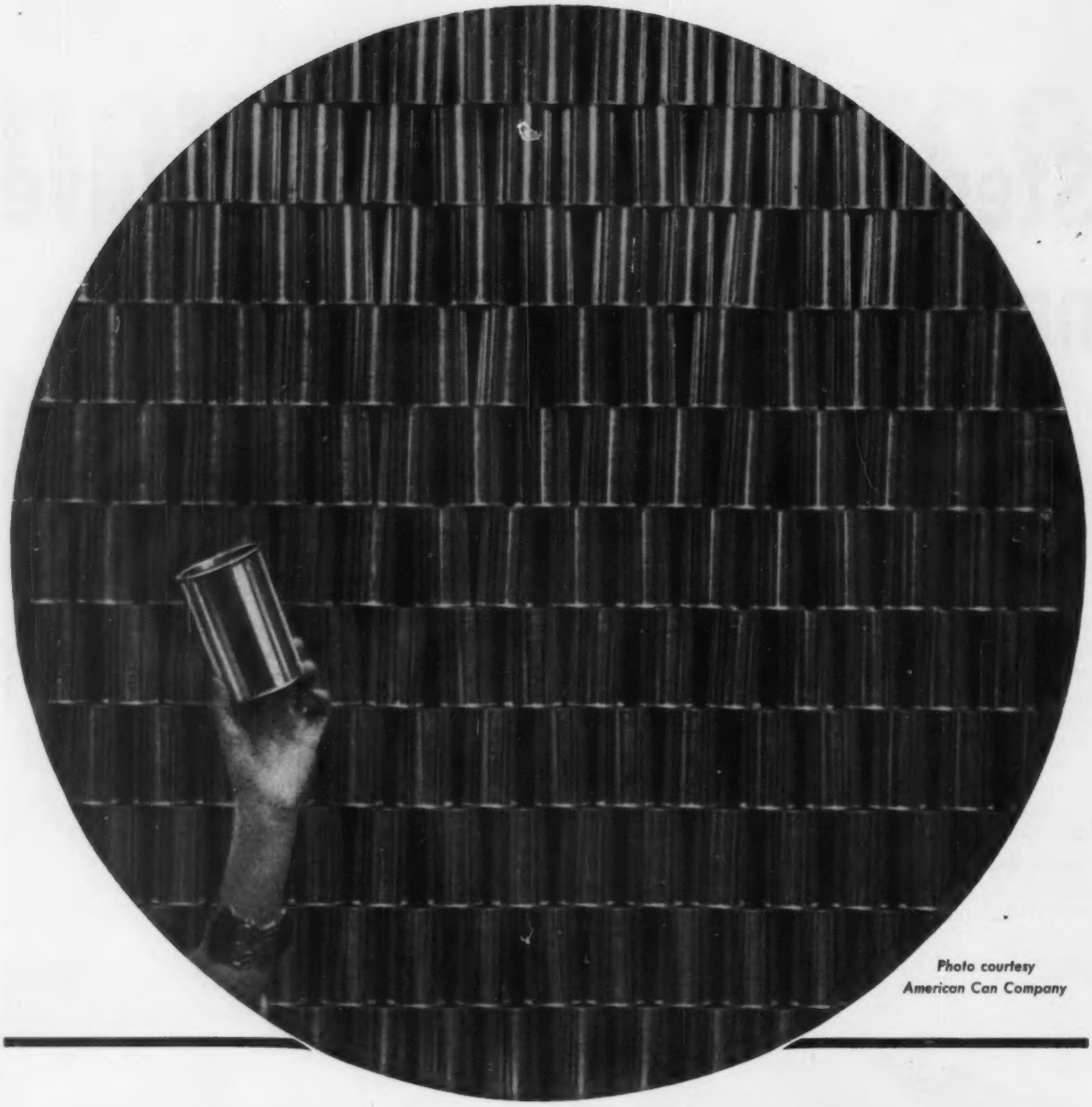


Photo courtesy American Can Company

TINPLATE UNEQUALED FOR PRODUCT PROTECTION!

Aluminum, glass, paper, plastic cannot match this combination of protective qualities available with tin cans: economy; strength in any size; durability; no effect on taste of contents; noncorrosiveness; ease in mass handling—no breakage; ease of display, stacking, stocking or storing; compactness; no light damage to contents.

Write for free subscription to TIN NEWS—monthly newsletter on tin supply, prices and new uses.

8 of every 10* Tin Cans are made with STRAITS tin from Malaya

*Based on U.S. Bureau of Mines statistics for 1954-58 average

The Malayan Tin Bureau

Dept.T-56B, 2000 K. St., N.W., Washington 6, D.C.

Who's Building What...

Monthly Reports: These food firms will spend $1,537,818 for expansion.

Low Bids/Contracts

Bailey's Bakery, Honolulu, Hawaii, bakery & office, $450,000.

Breuninger Dairy Co., Southampton, Pa., cold storage garage & office bldg., $150,000.

Campbell Soup Co., Chicago, soup canning plant alterations, $175,000.

Carling Brewing Co., Tacoma, Wash., warehouse addn., $122,818.

Coca-Cola Bottling Co., Durham, N. C., bottling plant, $200,000.

National Biscuit Co., Tacoma, Wash., warehouse & office addn., $110,000.

Oscar Mayer & Co., Vernon, Calif., cold storage addn., $170,000.

Pepsi-Cola Bottling Co., New Philadelphia, O., bottling plant, $160,000.

Proposed Projects

Anheuser-Busch, Inc., St. Louis, Mo., brewery addns., $20,000,000.

Armour & Co., Chicago, processing plant, $6,500,000.

Carling Brewing Co., Frankenmuth, Mich., brewery addn., $1,500,000.

J. G. Messick & Sons, Winston-Salem, N. C., grocery warehouse, $350,000.

Lawson Milk Co., Cuyahoga Falls, O., bakery, $1,300,000.

Morton Frozen Food Products, Inc., Crozet, Va., storage plant, $125,000.

Safeway Co., Clovis, N. M., milk processing plant, $300,000.

Seabrook Farms, Seabrook, N. J., freezer addn., $375,000.

Smithfield Meat Processors, Inc., Smithfield, N. C., meat processing plant, $400,000.

Sucher Packing Co., Dayton, O., plant, $300,000.

The big PLUS SERVICE EXPERIENCE RESEARCH PERFORMANCE in Oakite

Oakite DRYCID...acid in powder form... descales with safety and convenience

Oakite DRYCID, acid descalant in concentrated powder form, is far safer to use... much easier to handle than liquid acids. SAFER because potential danger of bottle breakage, liquid spillage and acid fumes is avoided. EASIER TO HANDLE because DRYCID comes in disposable containers. There are no heavy carboys to shift or store. No carboys to return. No costly book-keeping procedures.

Oakite DRYCID is safe for equipment, too. Inhibited, it won't injure steel or copper; neither will it hurt aluminum, brass or galvanized surfaces. DRYCID is particularly useful for removing scale and rust from such equipment as air conditioning units, heat exchangers, dough mixers, refrigeration equipment. For removing milkstone from H. T. S. T. pasteurizers, homogenizers, evaporators.

The BIG Plus in Oakite

Working with Oakite is like adding a competent cleaning engineer to your staff. It brings the results of lasting research in cleaning and sanitation... an end to waste of time and materials... mechanization of tedious jobs... a wealth of experience... unsurpassed materials *guaranteed* to do the job.

Write for Bulletin B-6564. Better still send for your local Oakite man. Oakite Products, Inc., 27A Rector Street, New York 6, N. Y.

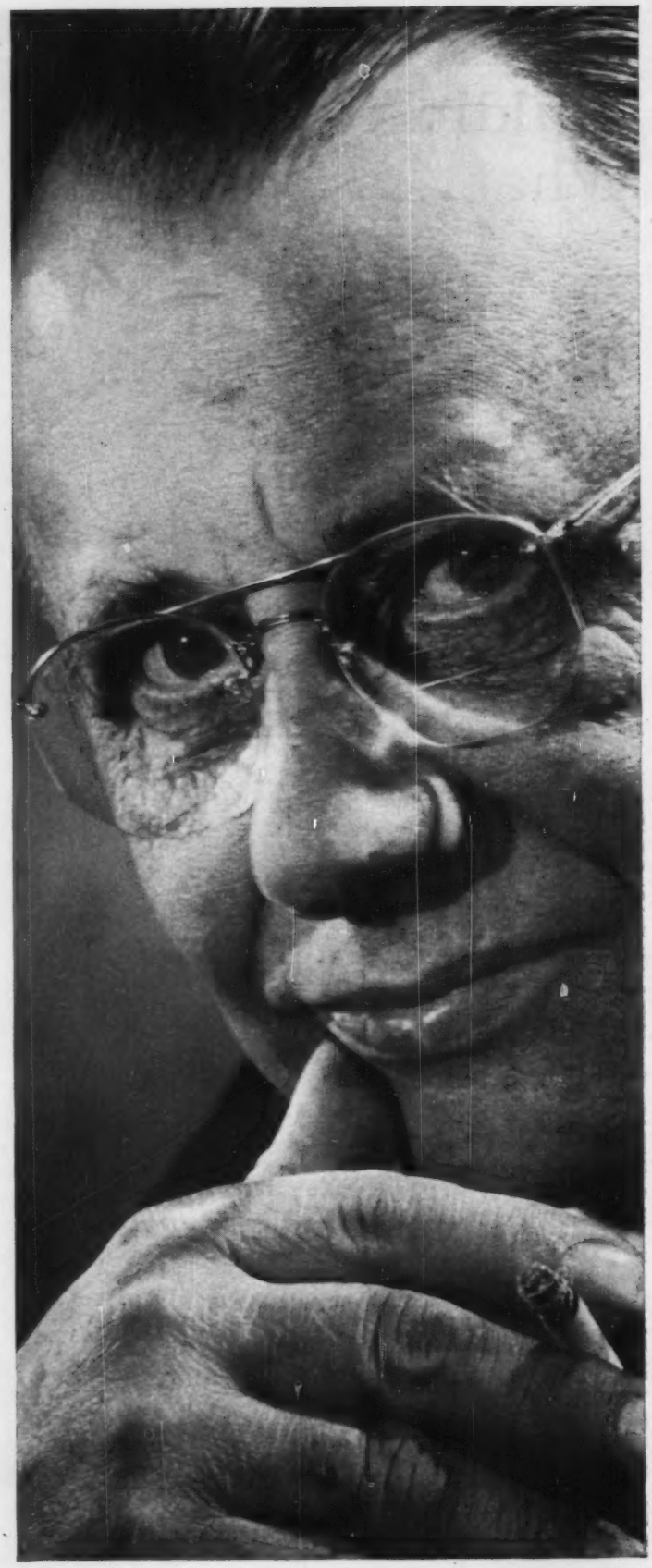
Export Division Cable Address: Oakite

OAKITE SCIENCE

over 50 Est. 1909 years' leadership in industrial cleaning

Technical Service Representatives in Principal Cities of U. S. and Canada

JOSEPH KESSLER —
Vice President in charge of Engineering.



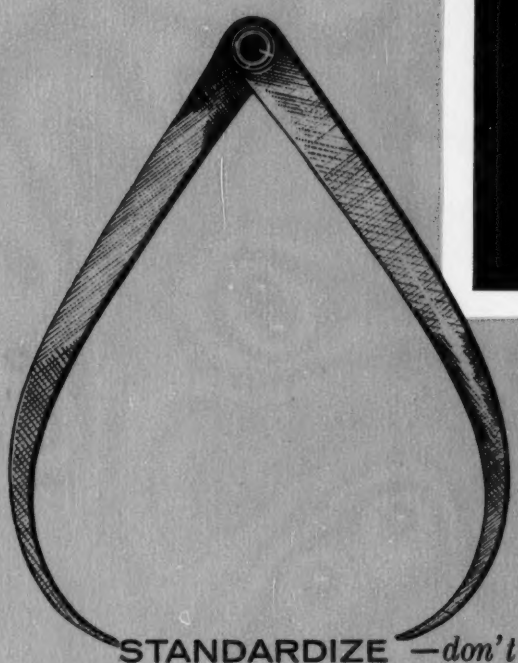
MEN, NOT MACHINES

Our job is to build the finest Valves, Pumps and Sanitary Dairy Fittings we know how. Our job is also to build systems. We accomplish our objectives with good men, good planning, good materials and imagination. All are important components of success. Good men are the most important..... they stir the continuing challenge to find new and better ways to be of genuine service. If you believe you will be served best by such men, not merely their machines — write. We will work well together.

G & H Products Corporation
5718 Fifty-Second Street, Kenosha, Wisconsin

Keep Faith With Nature—Guard Her Goodness

In your juice or blend . . .



STANDARDIZE —*don't jeopardize*

Nature never standardizes the vitamin C content of fruits. Nature's never uniform. Uniformity varies. So standardize —don't jeopardize—juice uniformity.

Standardize on juice excellence, with Roche® vitamin C (ascorbic acid). Capitalize on quality. Give fruit juices and their blends: acceptable vitamin C levels, ripe-fruit-flavor richness, a nutritional label claim.

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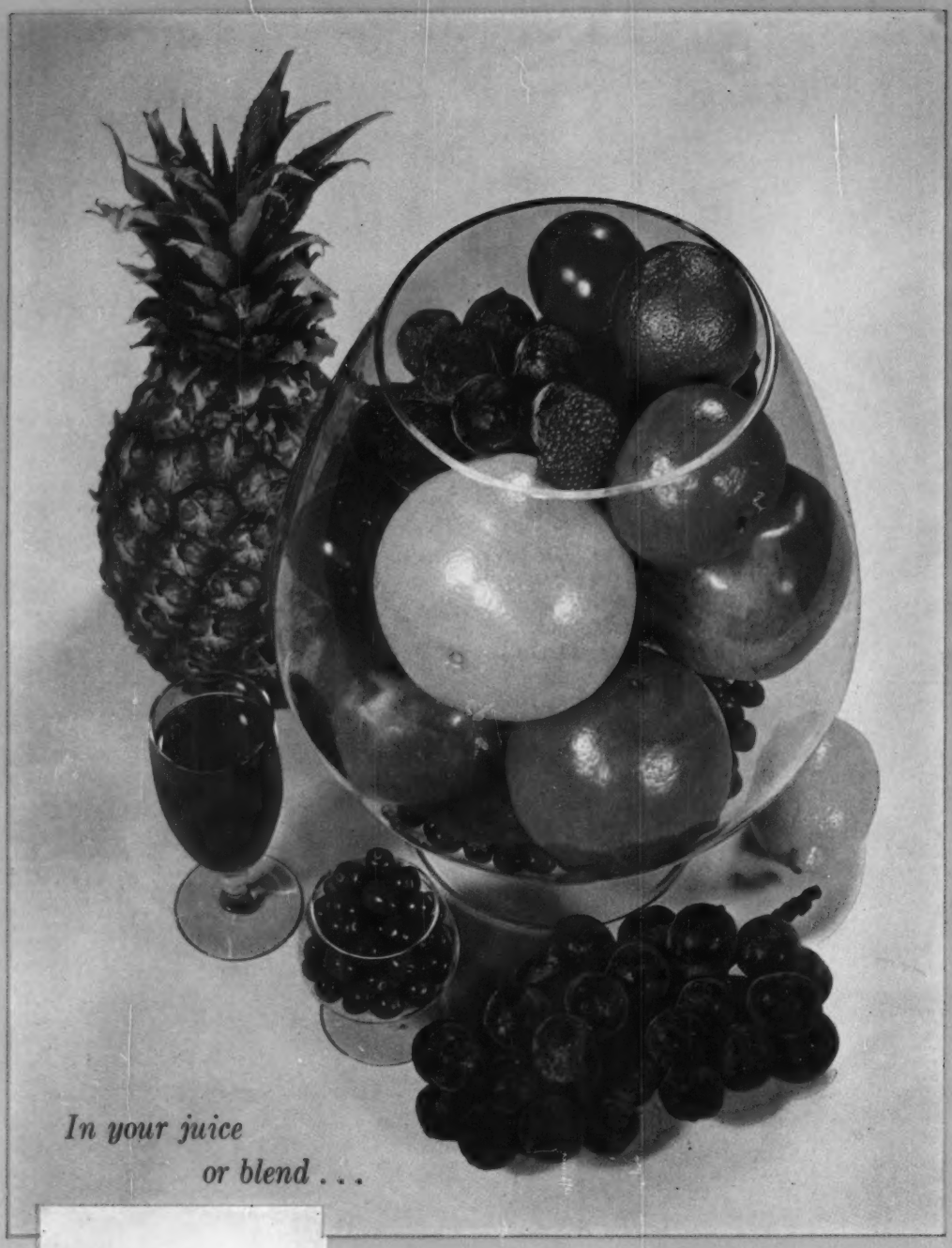
Keep Faith with Nature—Guard her Goodness



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FINE CHEMICALS DIVISION **HOFFMANN-LA ROCHE INC.** Nutley 10, New Jersey

Washington Report

FDA, FTC flex muscles . . .

Better write-offs may come . . . Congressmen busy

Fasten Your Seat Belt

Government probing of food industry—with emphasis on pricing and distribution practices—will show no letup from last year's rough tempo. Here's a recap on developments to watch:

Senate: Kefauver antimonopoly committee has nothing specifically set on food, such as last year's baking probe, but is watching the big volume of complaint mail it gets from consumers.

House: Patman's small business committee plans additional investigations of "monopoly trend" in wholesale and retail distribution. **Chains may be called on to explain their growth, but it's doubtful if Federal ban on manufacturing by big retailers could get enough votes at this time.** Steed committee may get another chance at dairy probe.

White House: Naming of Robert Kennedy, a "take charge" practitioner, indicates no slack in government's anti-trust and anti-merger drive.

Stepped-Up Enforcement by FDA . . .

New HEW boss Abe Ribicoff indicated FDA won't be back-seated by dept.'s medical care program. He spent 2 weeks preceding his take-over in quiet huddles with FDA officials. **Officials were pleasantly surprised to learn that their new boss (1) is "well aware" of their prickly compliance problems, (2) intends to work with staff professionals, and that (3) he won't take lack of zeal as excuse for inaction.**

Two other developments foreshadowed more FDA activity. Chances are good that agency will get most of the additional $4 bill, requested for it in Ike's last budget message. And HR 1235 proposes enlarged factory inspection authority for FDA.

. . . And by FTC

An irony facing new Administration is that its choice of a FTC boss will be hard put to match aggressive record chalked up by Republican Kintner. Kintner's shrewd innovation in making FTC demand company information which they had a right to all along—but never exploited—provides a rich lore of future legal actions.

Also, Landis recommendations for shaking up the commission may give the group more maneuverability. For example, he wants FTC to take over meatpacking cases from USDA, surrender some of its prosecutions to Justice, and be given more regulatory powers and right to impose stronger penalties. However, since Congress considers the regulatory agencies to be their province, it's problematical how far the Landis suggestions will go.

Dairy Cases Deep In The Pile

Despite the important ruling made in the Foremost merger case, FTC is still months off from acting on similar suits pending against other big dairy companies (such as National Dairy, Borden, and Beatrice). Changeover in administration slowed down disposition of cases, and there are still several older suits on the calendar ahead of the dairy ones.

A Little Breather for Anheuser-Busch

Justice Dept. is checking Anheuser-Busch's efforts to unload its Regal (Miami) brewery as ordered by the courts last year. A-B failed to meet Jan. 11 disposition deadline. Gov't. lawyers say if sale doesn't take place within 60 to 90 days, legal drive will be renewed.

More Realistic Depreciation Rates?

Long delayed reform of depreciation laws—which have been outmoded by inflationary spiral—may be hastened by U. S. Treasury survey of manufacturers. Large majority of 3,000 firms polled said rules governing machinery write-offs are out of date, and that because of rising costs a 25 yr. old machine may cost 50% more by time it is replaced.

Some 51% of companies asked for freedom to follow their own judgment on depreciation rates, another 29% said they'd settle for anything that recognizes higher replacement costs. House Ways & Means Committee is now studying the matter.

Favorite Sport: Filling the Hopper

Returning Congressmen last month lost no time in filing a slew of proposed legislation. Some of the more important bills touching on food:

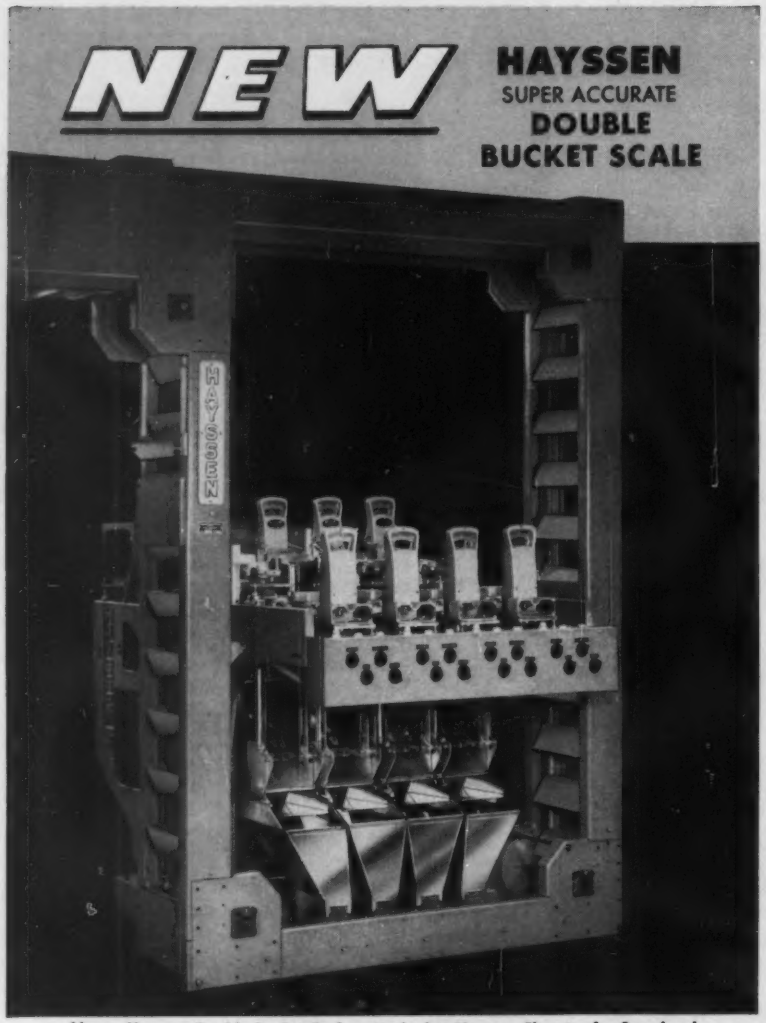
► S 23-HR 892: **Food stamp plan** for distributing $1 billion of surplus foods to the needy. Involves national allotments, coupons for low-nutrition households.

► S 212 & HR 50-61: Establish **Federal milk sanitation code** (regulated by Surgeon General). Any milk meeting this standard could move freely in interstate channels despite local health standards. Bigger producers have long sought this law so as to be able to market to wider areas.

► HR 1035: Sets up **official meat standards** to be carried in all advertising of such products.

► S 7: Create **new dept. in USDA** to promote greater industrial use of agricultural products, and to coordinate R&D work being carried out at government, educational, and business levels.

(turn page)



Above: Hayssen Double Bucket Scales attached to Hayssen Elevator for floor level feeding. Scales dump product to elevator buckets for delivery to filling tubes.

OUTPERFORMS ALL OTHERS

An entirely new principle has been developed to make the new Hayssen Double Bucket Scale the most accurate net weight scale feed in the industry. Rugged, easy to adjust scales, two each for each head, can be floor mounted for convenience.

- **DOUBLE WEIGHING** — Bulk charge is weighed at top scale, then transferred, slightly underweight, to second scale. Dribble trays feed second scale to bring charge to proper weight before dumping to filling equipment.
- **ONE-PIECE ACCURACY** — Extended dribble trays, each 30" long, allow one-piece feeding for final weighing. Packages can never be underweight.
- **FULL CYCLE FEEDING** — A full filling cycle is allowed for both bulk charge feeding and dribble feeding, thus allowing accurate weighing at greater speeds.
- **AVAILABLE FOR ALL HAYSSEN COMPAK MACHINES** — The new Double Bucket Scale can be attached to any existing Hayssen Compak Packaging Machine. It is available for both single tube and double tube machines.

first in Automatic Packaging since 1910

HAYSSEN

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Washington Briefs

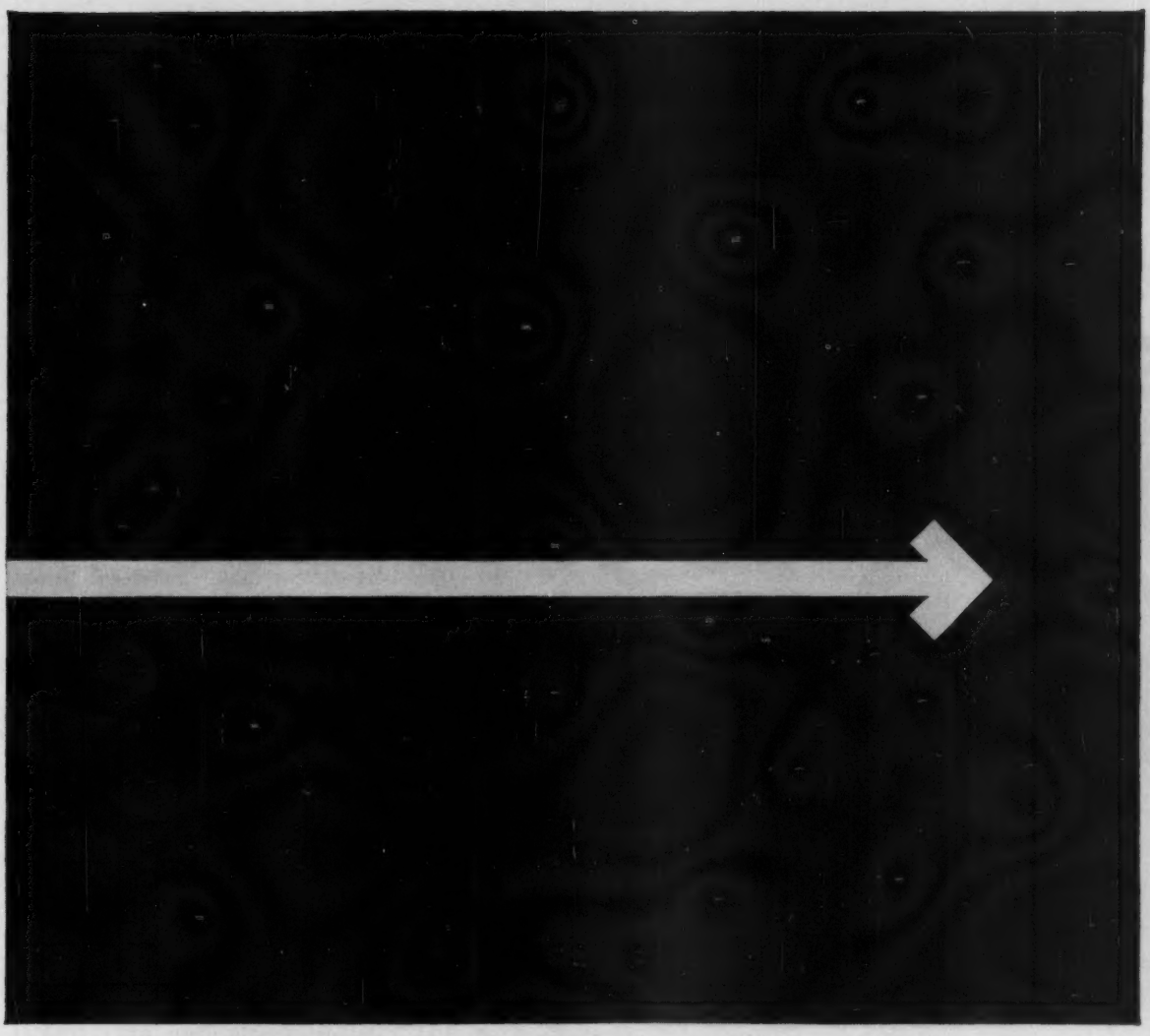
Smoked hams and other cured pork products received revised preparation regulations by USDA. They permit production and marketing, under Federal meat inspection, of some of these products with not more than 10% added moisture. Still in force are regulations prohibiting added moisture in smoked tongues, and smoked or unsmoked cured meats labeled cooked or ready-to-eat. Limitation of 8% added moisture in canned hams and other canned pork products remains unchanged. With increased consumer demand for juicier smoked meats, revised regulations permit packers to provide Federally inspected products to meet demand and satisfy wider product range.

A more practical application of U. S. #1 Bronze grade has been amended to Florida Orange & Grapefruit Standards by USDA. New amendment changes amount and type of discoloration required. Existing Bronze grade required simply that predominating discoloration must be of rust mite type. Now, more than 30% of fruits shall have more than ⅓ of surface in aggregate, affected by discoloration of rust mite type.

Comments of opposition have been fired on proposed amendment to Evaporated Milk Standards. Industry proposals sought use of stabilizer, and practice of asceptic canning. Opposing comments received from FDA in December sought exclusion of sterile concentrated milk from the Standards. Action on proposed amendment is not complete.

New approach to problems created by regional differences in peaches and varied needs of users and suppliers, is being tried by USDA. Currently proposed standards include series of manufacturing grades, each designed for specific end-uses in bakery, preserves, and ice cream.

Proposed revision of U. S. Standards for Grades of Onions would make major changes in grades now in effect, all designed to make the grades more useful to growers, shippers, and buyers. Value of onions grown in U. S. during '59 was over $60 million, USDA reports.



ONE CONSTANT IN THE FOOD PROCESSING EQUATION:

MORTON '999' SALT = UNVARYING QUALITY

Quality-conscious food processors, canners and packers from coast to coast are using Morton '999' Salt because it is the one ingredient you can always depend on for unvarying high quality. In fact, its constant quality has become the standard of the food industry. With Morton '999' Salt you insure a cleaner, more uniform flavor in all your processed foods.

Morton '999' is an economical premium-grade salt entirely free from bitter calcium and magnesium compounds that can distort flavor and downgrade product. It is always 99.9% clean pure sodium chloride, exceptionally low in the trace metals copper and iron.

Morton '999' is available everywhere—accept no substitute. Morton '999' is the highest purity salt commercially available everywhere in the United States. Its quality never varies from shipment to shipment, whether you buy it in bulk for direct salting, or in tablets made to your own specifications—either straight or blended with other flavoring agents. Send for complete information today!

Please send me more information on Morton '999' Salt

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Company_____

Address_____

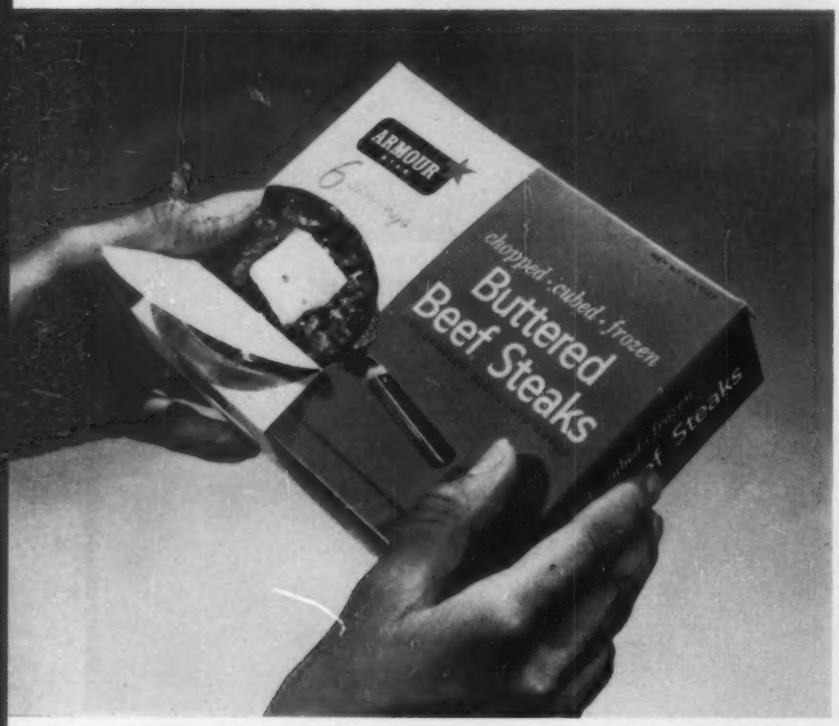
City_____ Zone____ State_____

MORTON SALT COMPANY

INDUSTRIAL DIVISION

Dept. FE-2, 110 N. Wacker Drive, Chicago 6, Ill.

new packages



PEEK-FLAP CARTON

NOVEL COFFEE JAR

FOIL TART CONTAINER

POTATO CHIP 'GRIP'

PEEK-FLAP CARTON FOR STEAKS

Freezer case peek-flap package that provides both product visibility and protection is now being used for frozen Armour Star Buttered and Chopped Beef Steaks.

Bend-back flap on the front of the red and white waxed chipboard container gives the shopper a clear view of the portioned steaks through a clear plastic film cover. And flap neatly coincides with product illustration in package design.

CARAFE JAR FOR INSTANT COFFEE

Versatility of glass is pointed up via this attractive "Continental Carafe" jar for instant coffee from Butter-Nut Foods Co., Omaha.

Jar employs a modern carafe design with a cylindrical base tapering to a narrow neck and contains a full 6 oz. of product. Final package is the result of extensive research aimed at devising a container that is "pleasing to the eye, distinctive in shape, and carries an instant association quality.

Designer is Gould and Asso. (402) and supplier is Owens-Illinois Glass Co. (403)

FOIL CONTAINER HAS PLUG-IN LID

Tart container with a raised vertical curled edge which can be covered with a plugged-in lid is now available from Kaiser Aluminum & Chemical Sales, Inc.

Curled edge makes it well suited for small baked items such as fruit tarts, as well as sauces, dips, gravies, nuts, and various desserts.

Container (No. 334) has a capacity of 6.3 cu. in. and holds 3.5 fl. oz. Top diameter is 3¾ in. and slant depth is 2½ in. (404)

'CHIP GRIP' FOR POTATO CHIPS

Potato chips go to market in "suitcase" fashion with this unique "Chip Grip" package introduced by

& products

Lawson Co., Cuyahoga Falls, Ohio.

Package, containing two bags of chips, is printed on Marathon Hi-Fi paperboard in a true brown leather likeness. Brand name, contents, and price mark appear as travel stickers in a variety of colors and shapes.

Basic carton style was designed by the manufacturer, Marathon Div. of American Can Co. (405)

NEW SHAPE FOR HERSHEY-ETS

Usually conservative Hershey Chocolate Corp. has changed both product shape and package design for its line of Hershey-ets.

Former "football" shape of the candy-coated chocolates has been changed to a flat disc type. Change was made "to improve eating qualities."

New package uses K-film, surface printed, with large areas of transparency. A yellow ribbon with the word "Hershey-ets" in maroon, and a stronger "Hershey's" logo provides greater consumer impact.

Actual candy colors remain the same. Blue-green printed area is also retained to provide an accepted remembrance factor.

MARKET DIET FOOD VIA MILKMAN

Milkmen are the salesmen for General Mills' new weight control food, Route 900," one of many new products aimed at the booming market sparked by Mead-Johnson's Metrecal.

A metered-calorie diet powder fortified with skim milk rather than water, product is a natural related-item sale for milk routemen. Flavored "Route 900" is sold in 225 calorie, 1⅛-oz. pouches, packed 12 to a carton (a 3-day diet).

Pre-measured foil/polyethylene/paper pouches insure exact calorie count, high potency, and full freshness. Riegel Paper Corp. supplies roll stock in 2-color gravure. (407)

COMBINATION WRAP FOR WHIPSTIX

A foil-paper-tissue lamination is being used to package Whipstix whipped butter, now planned for expanded east coast distribution by Hotel Bar Foods, Inc., N. Y. C.

Combination wrap, from Milprint, is claimed to protect and preserve freshness and flavor. Foil functions as an excellent moisture and gas barrier, is given rigidity by the middle paper layer, and is made heat sealable with the wax laminated tissue layer. Each bar is also individually wrapped. (409)

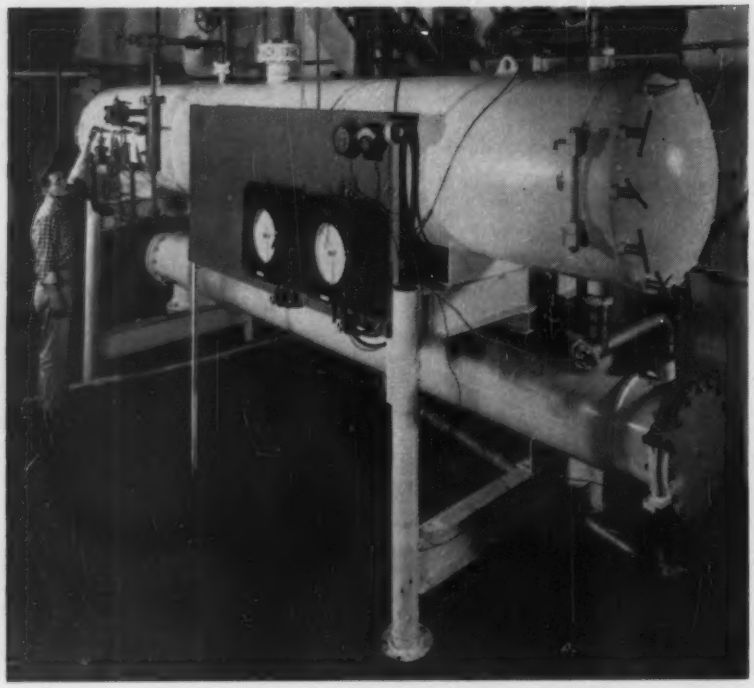
(turn page)

REDESIGNED HERSHEY-ETS

GM'S NEW DIET FOOD

WHIPPED BUTTER PACKAGE

FLUIDICS* AT WORK



How to cool 100 gpm of grape juice 'round the clock, with just 80 minutes for cleaning

When plate coolers were used to chill grape juice at SENECA GRAPE JUICE CORP., Westfield, N.Y., plant, a lot of valuable production time went into manual cleaning.

Down time cut. But now, with the two Pfaudler® shell and tube heat exchangers shown here, SENECA cleans just four times during a 24-hour day, taking only twenty minutes per cleaning.

No manual labor is involved, since no disassembling is required. In fact, the only time these heat exchangers are opened is for visual inspection. All cleaning is accomplished with a heavy-duty detergent.

Sanitary design. And thorough cleaning is assured, since the hinged heads are highly polished, and all connections are of sanitary design.

160° drop. The grape juice comes from a Pfaudler pasteurizer at 190° F., and enters the lower unit where it is cooled by water to 80° F. After that it goes to the upper unit, which cools with ammonia to 30°-32° F., just right for cold storage.

Full line. Heat exchangers and pasteurizers are part of an extensive Pfaudler line designed to provide efficient processing with maximum sanitation and minimum need for maintenance. You also can obtain fillers, storage tanks, centrifuges, dryer-blenders, and evaporators.

More facts. We'd be happy to provide full details on any or all of these items. Please address your inquiries to our Pfaudler Division, Dept. FE-21, Rochester 3, N. Y.

*FLUIDICS is the Pfaudler Permutit program that integrates knowledge, equipment and experience in solving problems involving fluids.

PFAUDLER PERMUTIT INC.

Specialists in FLUIDICS...the science of fluid processes

PLASTIC SHAKER TOP for Borden's Grated Parmesan & Romano Cheese canister replaces conventional metal "punch-hole" type of closure. Easy-opening and closing top is supplied by Cleveland Container Co. (410)

Packaging Briefs

"Flip Flap" ice cream carton from Container Corp. of America features easy top-opening, top-dip serving, and simple reclosure. (411)

"Poly-Eth" 1018, new polyethylene resin from Spencer Chemical Co., has reported coating speeds which are 10-30% higher than normal while retaining required physical properties and good adhesion. (412)

Trycite, a bi-oriented, polystyrene film from The Dobeckmun Co., is being used for shrink packaging produce by The J. F. Sanson & Sons Co., Cleveland. (414)

Plastic Clips for six-pack packaging, are now in use at Arizona Brewing Co. Supplied by Tay-Pack Corp., "Phantom Pack" is said to weigh less, cost less to handle, require less storage space, provide safe stacking, and encourage multi-can sales. (416)

North Brite Blended paperboard, made from a homogeneous blend of virgin pulpwoods, has been announced by Packaging Corp. of America. Material is a solid sheet and is claimed to provide superior strength and rigidity with thinness and light weight. (417)

New Product Shorts

Chicken Sâpreme & Vegetables and Potted Beef & Vegetables are two newest items in fast-growing line of Howard Johnson's frozen food.

Nutty Dane, Devils Kiss, and Champagne Yodeler are exotic names of three appetizer cheese balls introduced by Armour & Co. under Continental Cuisine brand.

Four new Duncan Hines Quick Cooking Rice products are being debuted by Blue Ribbon Foods, Suffern, N. Y. —dehydrated Fried Rice, Spanish Rice Dinner, Rice Stuffing, and Chocolate Rice Pudding.

Packaging materials that protect...while they save...while they sell

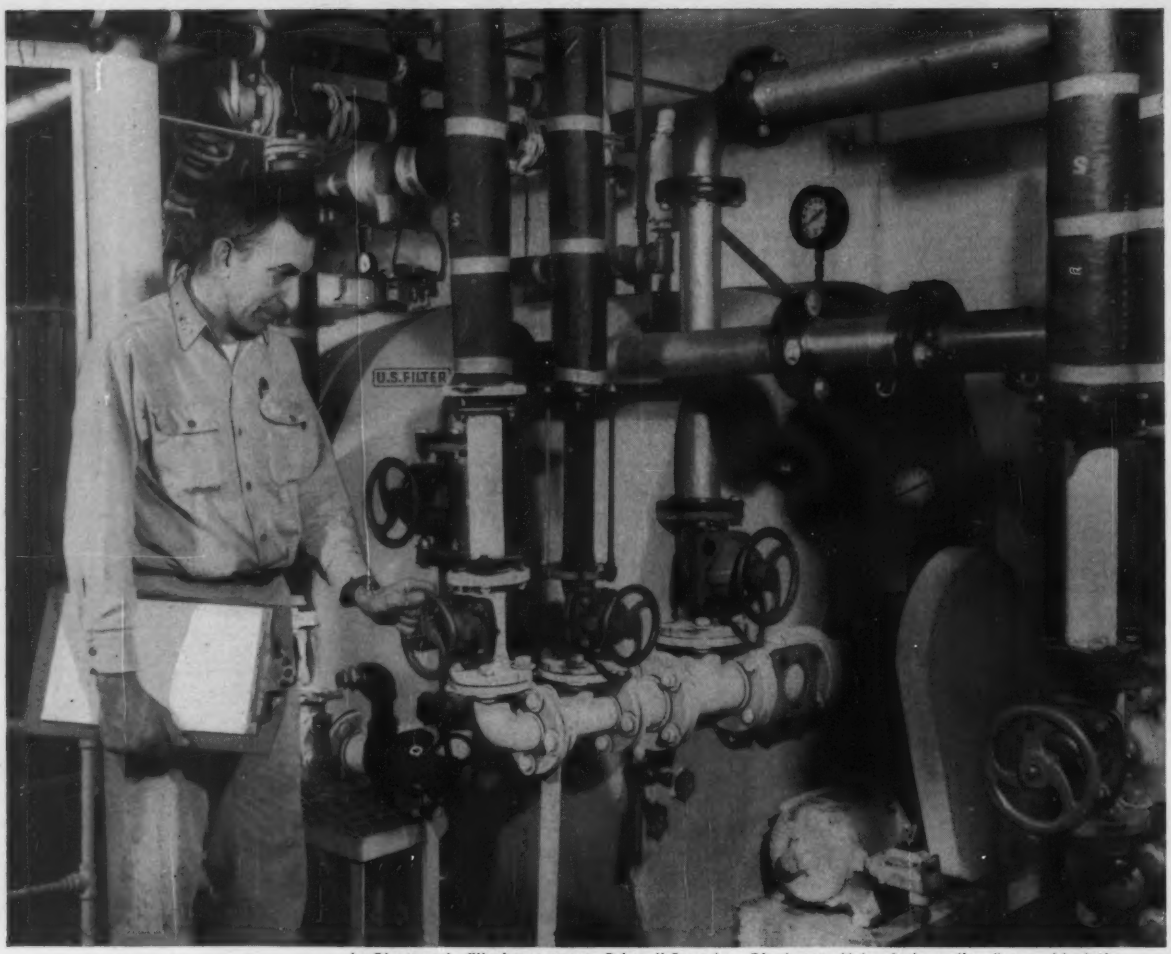
IN INSTANT COFFEE

Three out of five leading instant coffee marketers are *regular* users of Riegel protective packaging materials. Why? Because their long experience with Riegel's technical leadership has led them to rely on Riegel to produce the right paper for their products. You'll find this same confidence among sales leaders in many *other* fields . . . a good reason why you too should talk to Riegel.

3 OUT OF 5 BUY Riegel

Riegel offers more than 600 different materials . . . tailor-made and standard. Pouch papers, paperboards, glassines, foils, films . . . laminated in various combinations . . . plastic-coated or waxed . . . printed or plain. You are assured of just the right combination of product protection, machine efficiency and low cost. Write to Riegel Paper Corporation, 260 Madison Ave., New York 16, N. Y.

CIRCLE 27 ON READER SERVICE CARD



In Glenmore's filtering process, Grinnell-Saunders Diaphragm Valves' streamline flow and isolation of bonnet mechanism guard product purity. Filtering unit manufactured by U. S. Filter Company.

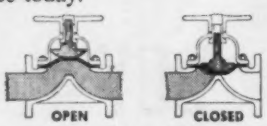
Even during filtration at sub-zero temperatures . . .

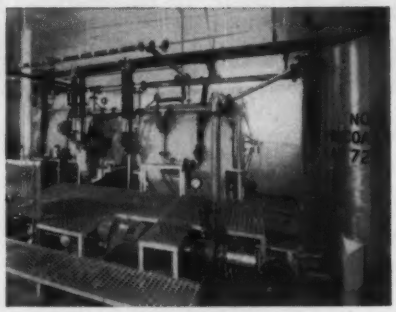
Grinnell-Saunders Diaphragm Valves keep whiskey sparkling clear for Glenmore Distilleries

Glenmore Distilleries Company reports that at their distillery in Owensboro, Ky., only Grinnell-Saunders Diaphragm Valves could safeguard clarity and also give proper control of flow in the filtering system.

Grinnell-Saunders Diaphragm Valves give the whiskey streamline flow . . . have no pockets to trap particles. What's more, the bonnet mechanism is *completely* isolated from the fluid in the line by the Teflon diaphragm. Result: clarity reading of 2 Nephelos, lowest in the industry!

You get a wide choice of body, lining and diaphragm materials with Grinnell-Saunders Diaphragm Valves. Learn how these dependable valves can help your production. Contact your nearest Grinnell office today.





Here's where Glenmore filters whiskey at sub-zero temperatures.

GRINNELL COMPANY, PROVIDENCE 1, R. I. • BRANCH WAREHOUSES AND DISTRIBUTORS FROM COAST TO COAST
PIPE FITTINGS • VALVES • PIPE HANGERS • PREFABRICATED PIPING • UNIT HEATERS • PIPING SPECIALTIES

Food Industry Could Win Cold War for Freedom

What's the most vital thing in a hungry world?

Food! But Americans take food for granted while being tremendously impressed with rockets to the moon and such.

The cold war won't be won by rockets. Russia is winning it with economic maneuvers. "We value trade least for economic reasons and most for political purposes," says Khrushchev.

Rome fell—United States slipping

Rome in its splendor of technical and cultural advances didn't survive the Vandals and Visigoths.

Now the United States is similarly slipping—and in the face of the most determined and insidious enemy the world has known.

While Russia develops non-military combat to an exact science, we sit by without a cold-war weapon other than government foreign aid. And that is running out on us.

But we do have a ready-made weapon—a potential world-buster. It's time we use it with the purpose, determination, and dispatch called for in a final fight for survival.

The weapon is food. Not surplus food for backward countries. That wouldn't put crumbs on the table of this hungry earth.

No, the way to win the world is to help it feed itself.

Our industry has done a phenomenal job of feeding people. This has been achieved not by know-how alone. Free enterprise is an even greater factor.

Russia is acquiring food know-how, so Milan D. Smith, president of NCA, told this editor after returning from Russia.

Food firms can do what USSR can't

But the Soviet is not acquiring free enterprise. Therefore, our private food industry can do what the Russia government cannot do. It can show foreign nations how to live better by eating better. It can show them how to eat better by: (1) Upping agricultural output. (2) Preserving what is produced. (3) Speeding distribution. (4) Marketing efficiently.

Fastest way would be to expand foreign operations now so successfully conducted by several leading food firms. Fortunately, such operations can earn a profit while making priceless contributions to the societies they serve.

Other ways are: (1) to participate in GMA's program (FE, Dec., p. 29), or (2) to send men abroad on government-sponsored business junkets.

Each branch of industry could well take a tip from Dairy Society International. A 14-year-old vehicle for widening world dairy markets, DSI includes dairy processors and equipment suppliers. It cooperates with government and advises UNICEF Board of UN.

But most importantly it gets volunteers from US industry to go abroad as dairy ambassadors.

Food manufacturers and their associations should plan with purpose to help win the world for freedom—and quickly.

They have the world-busting weapon!

MARLEX*... for quality packaging with greater sales appeal!

Which of these modern packages is right for your product? Whether it's a blow molded bottle, extruded tube, film overwrap, a thermoformed or injection molded container; the result will be increased sales appeal with a package made of MARLEX plastics. Attractive appearance . . . excellent feel are two reasons. Wide temperature range is another. MARLEX high density polyethylenes and ethylene copolymers withstand temperatures from 250° to −180°F. Alkalies, acids, chemicals, oils and greases are no problem. And MARLEX is odorless, tasteless, non-irritating, and biologically inert.

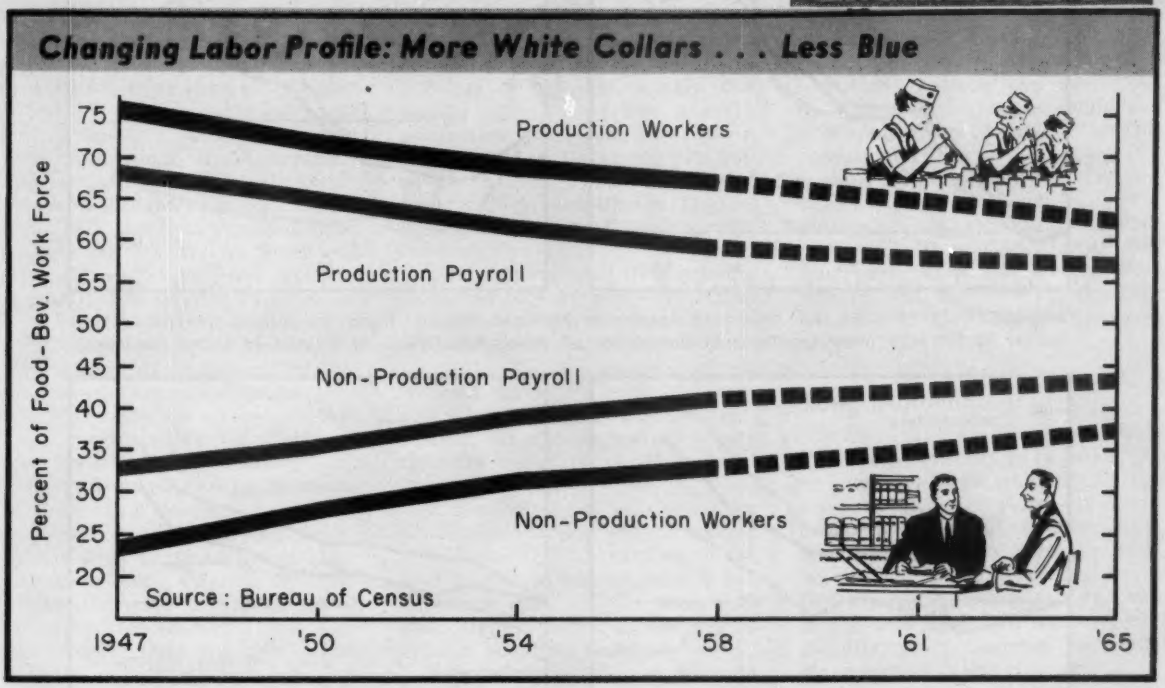
To packagers, the high quality of MARLEX resins means truly efficient package production . . . easier printing, wrapping, filling, sealing. With MARLEX you're sure of package performance . . . verified and supported by extensive research data.

*MARLEX is a trademark for Phillips family of olefin polymers.

For more information on MARLEX high density polyethylenes and ethylene copolymers . . . medium and low density polyethylenes—see your package supplier . . . or contact us directly.

PHILLIPS CHEMICAL COMPANY
Bartlesville, Oklahoma
A subsidiary of Phillips Petroleum Company

PHILLIPS 66 MARLEX PLASTICS



New Face of Labor

. . . caused by growing numbers of non-production workers, means management must plan now for decade's personnel and productivity requirements. Unions, too, must be satisfied

LABOR'S COLLAR is rapidly turning a lot less blue and considerably more white in the food and beverage industry. Reason is the steadily increasing share of the workforce composed of non-production workers—employees not directly involved in the manufacturing operations of a food company.

Considered along with related shifts in population, mechanization, and productivity, this trend indicates a new face of labor that must be anticipated and prepared for right now by the successful business manager.

According to an FE analysis of data from the Depts. of Labor and Commerce, three noticeable trends are shaping up in the food and beverage workforce:

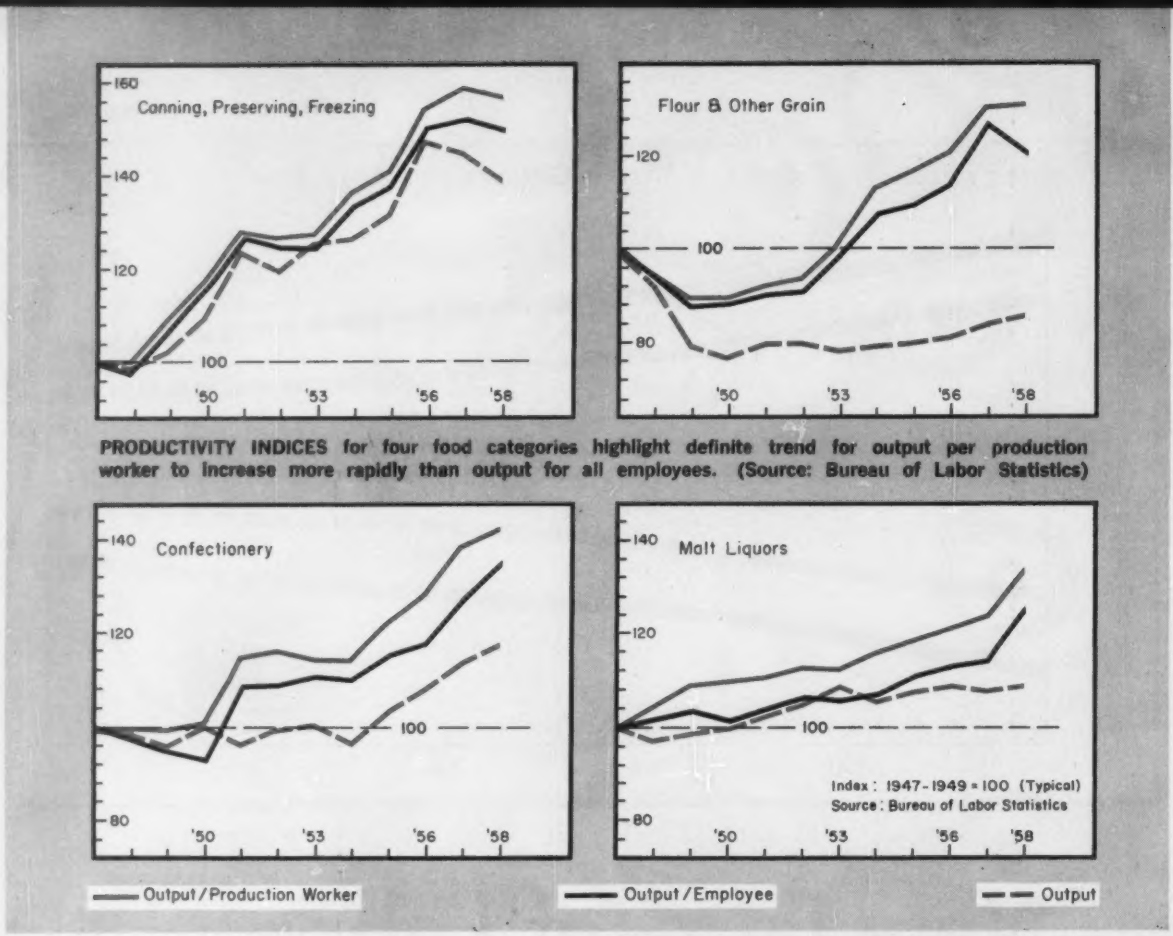
► Non-production employees have increased their share of total employment from 25% to 33% in the years '47-'48 (See above graph). And, from '54-'58, actual numbers of non-production personnel jumped 10%

► Numbers of production workers actually decreased 1% from '54-'58 (Table I), although total employees increased 2.5%. In '65, they are expected to form only 63% of the work force (from '47's 75%) and the time will probably come when they will outnumber their "non-productive" counterparts appreciably.

► Productivity indices (BLS) for four out of five selected categories of the food and beverage industry, showed that output per production worker has increased much faster than output per employee from '47-'58.

Reasons generally offered for the increase in non-production workers are the growth of research staffs and the need for more and more people to handle the increasingly complex sys-

JACK L. MISCHOU, Assistant Editor, "Food Engineering"



PRODUCTIVITY INDICES for four food categories highlight definite trend for output per production worker to increase more rapidly than output for all employees. (Source: Bureau of Labor Statistics)

tems of marketing, production control, and communications.

Mechanization or "automation" is quite often cited as the reason for the decreasing percentage of production personnel. However, in most cases, production workers replaced by machines have found their way into the non-productive field to handle a correspondingly increased amount of paperwork.

Whatever the reasons, trends pose several problems for management, such as trying to:

. . . **Increase output of the non-production worker.** Difficulty here is getting more for the marketing dollar from salesmen, admittedly a hard-to-tackle solution. Then, too, with more administrative posts becoming inevitable as business becomes more complex, how can productivity be measured, let alone be increased?

. . . **Fill more and more administrative posts with fewer qualified personnel.** Right now, there are 11.4 million males in the important middle - management age group of 35 through 44. In 10 yr., that figure will drop to 11 million. And there will still be 28 million more people to be fed as a result of the population boom in under-21 and over-55 age groups.

. . . **Meet the increasing demands of labor for organization of the presently unorganized non-productive or "white collar" personnel.**

This group will become the big target for unions as the production workers decrease in numbers —and is already being subjected to active AFL-CIO attempts to organize. And, if unions make deep penetrations into the non-production employee category, it may have an effect on management's attempts to raise their productivity.

. . . **Make a smooth overall transition of labor as business shifts from a manufacturing-oriented to a marketing or customer-oriented type of structure.** This trend for all industry means placing even more personnel in new product development, consumer and market research, administration, planning, and other "non-productive" areas.

Trails Other Industries

Compared with the average of all manufacturing industries, food and beverage's jump in non-production workers was actually far behind (10% to 31%).

Reason is probably two-fold: (1) bigger consumption market to serve from a production standpoint—number of all workers increased slightly faster than the rest of industry, and (2) slower introduction of new labor-saving machinery—McGraw-Hill's Survey of Modernization Needs (FE, Oct. '58) listed food and beverage as having one of the highest percentages of machinery over ten years old.

However, a sharp increase in non-production personnel can be expected for food and beverage in next decade as population continues to boom but more mechanized equipment is introduced.

Here's a check of '54-'58 labor shifts in various food and beverage categories that will help you shape an industrial relations program geared to the new labor profile.

Meat firms kept total number of employees at nearly the same level. Production workers dropped off 1% while non-production peo-

ple were gaining 10%. Total payroll costs jumped 20%, about average for food and beverage, but wages paid to non-production increased 8% more than production.

One of the biggest meat-packers, Armour & Co., anticipated some time ago that increased mechanization might create union problems. It entered into an agreement with the Amalgamated Meat Cutters and Butcher Workmen and the United Packinghouse Workers to establish a fund to study problems arising from modernization.

Recommended solutions have included training programs for employees who are moved to new jobs and the promotion of new employment opportunities for displaced workers within the company.

Dairy firms noted a 7% decrease in production workers but a 5% increase in all employees to go with a 17% jump in non-production personnel. Payroll for non-production jumped the highest of all categories (34%), a 20% bigger change than the production payroll. Significantly, total manhours fell 7%.

Canners and freezers, with a 9% increase in total employees, proved to be the biggest labor growth industry among the major categories. Non-production workforce giant-stepped 25% and even production workers moved ahead 6%.

Continued market acceptance of frozen and convenience foods is reported to be the reason for this growth. Manhours actually increased 6% in the 4-yr. period.

However, according to a recent U. S Dept. of Labor study, "Indexes of Output Per Man-Hour for Selected Industries (1947-59)," this group also followed the pattern for output per production worker to increase more rapidly than output for all employees (see graph series). Of the five food categories mentioned in the BLS study, only beet sugar proved immune to this trend.

Grain mill firms continued the pattern of the industry and posted a 1% decrease in number of employees, and a 5% decrease in production employment. Non-production employment was boosted 6%. Here, again, BLS productivity per production worker was well ahead of the per employee output.

Baked goods firms maintained about the same number of production employees but did so with 3% increase in the total workforce. A comparatively small increase in non-production employees (8%) can be chalked up to increased production consumption and the increased number of new products, which are usually initiated without a fully mechanized plant.

Sugar firms kept nearly the same number of workers and cut production employees 8%. But a 40% increase in non-production people helped swell their total payroll 25%, one of the highest increases in the food and beverage industry.

Candy and related item producers noted only a slight 3% drop in production employees but still increased number of non-production by 13%. Though number of all workers moved up only 1%, total payroll costs jumped 14%. Nevertheless, labor costs were 9% less than the increases for all food and beverage.

Productivity per confectionery product production worker jumped 40% from '47-'58 according to the BLS survey, compared to 35% per employee and 17% for total output. Biggest part of the output increases occurred from '54-'58.

Beverage firms showed drops in both number of employees and production workers—3% and 8% —and non-production personnel increased only 2%. Beverage labor costs posted the smallest percentage increases of all food and beverage categories. Even payroll percentage boost for non-production people was 17% below the industry average.

The malt liquor division noted only a slight increase in BLS-studied output from '47-'58, but output per production worker followed the pattern and was well out ahead of output per employee.

Miscellaneous products joined canned and frozen in posting increases all along the line, including an increase in production employees. This, of course, helped push payrolls up 28% during the four year period. Manhours also jumped 5%, compared to the 2% decrease for all food and beverage.

Blame Automation?

While this study shows that production workers have fallen off in numbers, large scale dismissals are not solely the result of automation because the introduction of machinery is rarely carried out at one stroke. And according to a BLS analysis, a company can usually absorb displaced workers, especially when business is good. Management can also minimize worker hardship and uneasiness by taking preparatory steps in advance of the change-over, such as provided by Armour & Co.

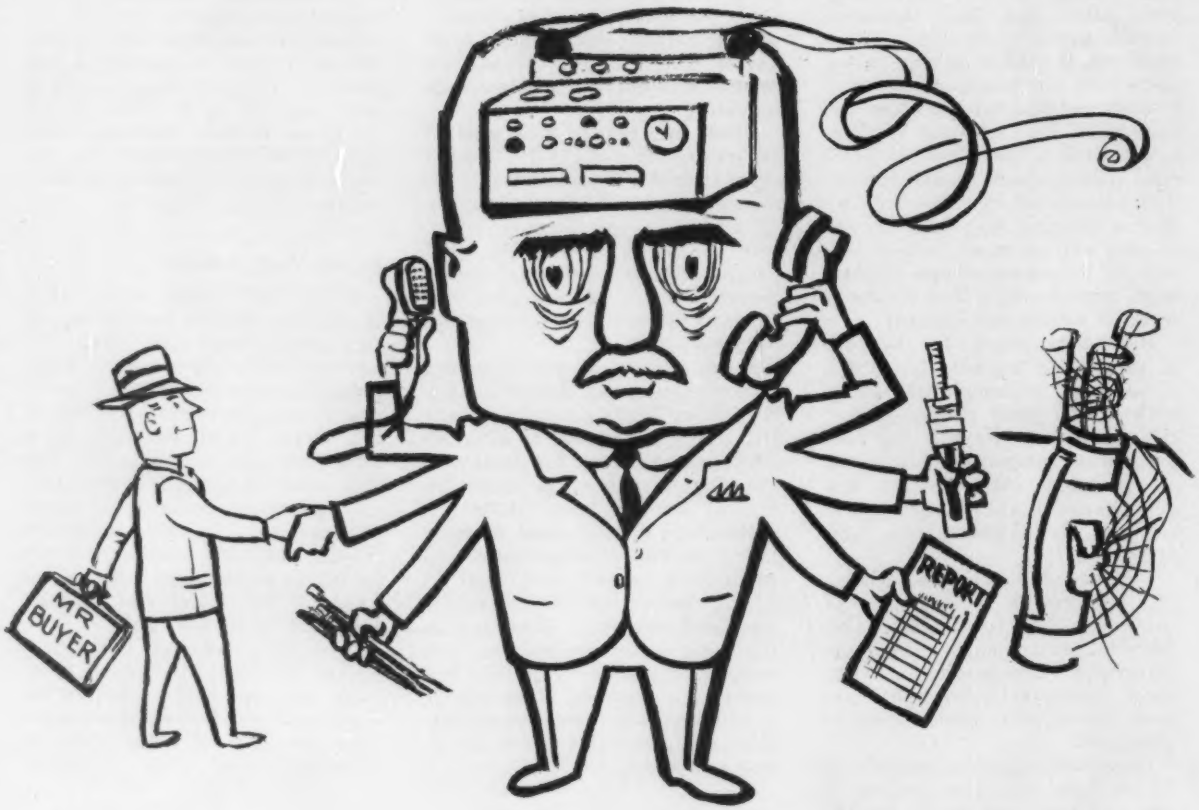
According to former Labor Secretary Mitchell, "Personnel planning is as essential to modern industry as are the new machines." The new face of labor must be satisfied. (End)

How Food-Beverage Workforce Shifted—1954-58

Product Category	Total Employees	Production Workers	Non-Production Workers	Total Payroll Costs	Production Payroll Costs	Non-Production Payroll Costs	Manhours
Meat	none	−1%	+10%	+20%	+17%	+25%	−3%
Dairy	+5%	−7	+17	+25	+14	+34	−7
Canned, Frozen	+9	+6	+25	+24	+23	+26	+6
Grain Mill	−1	−5	+ 8	+16	+13	+20	−5
Bakery	+3	none	+ 8	+19	+18	+21	−1
Sugar	none	−8	+40	+25	+23	+32	+2
Candy, Related	+1	−3	+13	+14	+13	+16	−4
Beverages	−3	−8	+ 2	+14	+11	+ 8	−5
Miscellaneous	+6	+3	+13	+28	+28	+29	+5
All Food & Bev.	+2.5	−1	+10	+20	+17	+25	−2
All Industries	+2	−5	+31	+24	+11	+53	−5

Source: Bureau of Census

Type of Manager You'll Need...



Where To Aim Your Planning

Getting a head start on new decade's challenges will put your marketing program in high gear for rocky road ahead. Top flight management consultant pinpoints critical operation areas that must be checked now for tomorrow's payoff

JOHN R. SARGENT, Partner
Cresap, McCormick and Paget, New York

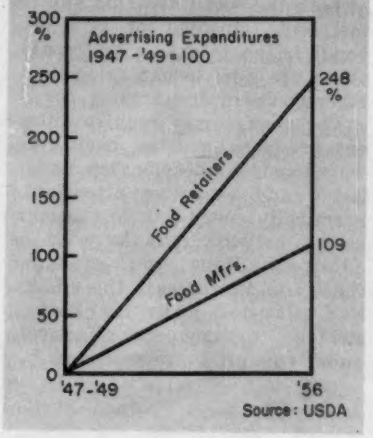
MARKETING in the new decade will be no picnic—for the sixties will present possibly the most intense competitive activity that you have experienced in the last 20-25 yr.

Why? Companies of all types have made great advances in production capabilities and efficiencies—in modern equipment and new processes, enlarged R&D facilities, faster new product development. Many companies have upgraded their sales manpower and tested new selling, distribution, and promotion techniques to gain a bigger competitive edge.

Given this kind of business climate, what competitive marketing problems will your company

...To Cope With These Challenges

... Greater Ad Competition



... More Sophisticated Shoppers

College graduates as % of population 20 yr. & over

1940		4.5
1950		6.0
1960		7.3
1970	(est.)	8.5
1980	(est.)	9.8

Source: Census Bureau

... Harder Fight for Shelf Space

No. of items handled per store

1950	3,750
1958	5,400
1965 (est.)	6,400
1970 (est.)	7,000

Source: Progressive Grocer

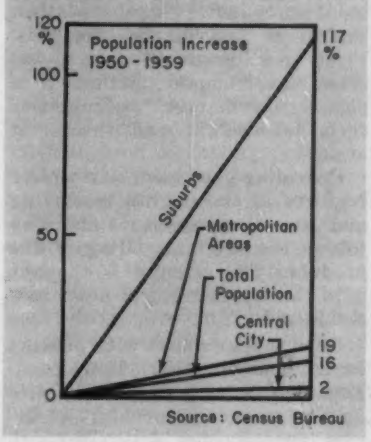
... More Retail Concentration

No. of stores that do 70% of food sales

1939	1948	1954	1958	1960
112,000	90,000	50,325	44,501	39,500

Source: A. C. Nielsen

... Shifting Targets



for Bigger Profits in '60s

face the next 10 yr.? Based on our experience with clients, we see 14 major problems which fall into three broad groups—the market place itself, marketing methods, and marketing management.

1. Problems in The Market

► **Greater Price-Consciousness.** There has been an intensification of price-consciousness in recent years; there is every indication it will continue. Frequently, wittingly or unwittingly, price-consciousness has been fostered by manufacturers, distributors, and dealers. Despite generally good levels of income, we see greater price pressures than ever before—traveling back along the chain from consumer to distributor to manufacturer.

Here are some key areas to examine to make sure your pricing strategy will be on target:

Has the probable price situation in your field been forecast as a basis for future planning? Have cost studies been made of every phase of your operation to determine what might be done if things get worse? Have you actually checked out (not just mentally tested) different selling approaches designed to counter the price competition problem?

► **Increased Customer Sophistication.** Average

"As mass dealer organizations grow . . . expect them to try to share in the manufacturer's as well as the distributor's profits."

consumer is becoming more sophisticated regarding product and advertising claims, partly because of widespread criticism of such assertions. This problem can force a change in marketing approach in many kinds of businesses. Have you examined this problem of increasing consumer sophistication from the standpoint of your own company?

► **Greater Demand for Services.** Need for service is here to stay—and the problem is going to be tougher to solve in the sixties. There are two reasons for this. First, most products tend to become more complex. Second, in a competitive market, the customer feels his weight and throws it around.

Providing good customer service requires as thorough a marketing and general management planning job as the original selling of the product. Too often it is thought of at the last moment of new product introduction.

Good service starts with product design and planning: Many products seem to be designed for a production economy, not for a service one. Proper follow-through requires training your own sales organization, and your distributor organizations, not only in the techniques but also in good customer relations.

Have you assessed the importance of service and given it proper attention?

► **Wider Discretionary Choices for Customers.** In spending his money today, the consumer is pulled in many directions. To the manufacturer of the more convenient-type product — the purchase of which can be switched, delayed, or put off entirely—the implications are important. Your competition is now proportionately greater—you are competing not only against manufacturers in the same field but also against a vast array of manufacturers of other appealing consumer products.

Many industry trade associations are developing campaigns to protect or enhance the share of the consumer's dollar being spent on their particular products. Has your company thought through its strategy in this whole "discretionary buying" area?

► **Geographic Shift of Customers.** The trends have been in evidence for many years—population shifts to the Southwest and Far West, and from city to suburbs. These shifts will continue in the next 10 yr. Have you considered the implications of continuing geographic shifts in terms of sales force allocation, strength of distributor organizations, and even plant location?

► **Market Concentration and Distribution in Fewer Accounts.** We have already witnessed great changes through mergers and acquisitions in the food industry—at both the manufacturing and retail ends. Instead of relatively small sales to many accounts, there are now larger sales to or through fewer accounts.

The change may require different products, pricing, packaging, warehousing, salesmanship, advertising and executive attention—practically every link in the marketing network may have to be adjusted. Have you examined these trends, forecast the effects, and planned your marketing strategy to compete effectively under changing circumstances?

2. Problems in Marketing Methods

► **More Private Label Competition.** In the area of private label competition, it is logical to expect a continuation of trends which have been under way during the first decade. As mass dealer and distributor organizations grow in size, there is every reason to expect them to try to share in the manufacturer's as well as the distributor's profits—which is, in effect, what the sale of private brands tends to do.

Average manufacturer frequently has helped build private brand business, delivering largely the same qualities and styles in private brand merchandise as in branded. Moreover, the larger and more aggressive mass distribution outlets and chain stores have insisted on high quality—and the customer seems to have caught on.

If you are up against private brand competition, have you formulated a long-term program for researching and strengthening your market position? If private brand competition hasn't been felt in your product field as yet, have you thought how you will cope with it if and when it does appear?

► **Less Personal Salesmanship.** Display merchandising, backed by pre-selling through advertising and promotion, will continue to make strides in the sixties. It has multiple implications and possible headaches for your marketing program.

How can you cash in on this fast-growing type of outlet and still maintain relationships with older existing outlets which are still important? If you have a higher-quality product, how can you make it stand out—justify its premium price—without the spoken word? Salesmanship is still necessary, but it's a different brand of salesmanship.

Have you carefully examined the selling techniques which best suit your products? Have you studied the caliber and sales approaches of your sales force in relation to requirements for effective marketing? Are you experimenting with different selling slants in developing new customers?

► **Higher Costs of Distribution Generally.** Some distribution costs are kept up by competitive pressure, some by the fact that the customers have come to expect certain niceties and flourishes. **No manufacturer has taken the initiative in pointing out the costs involved.**

The use of bulk handling is continuously growing. Computers are being used to keep branch inventories at more workable levels. "Selective selling"—concentrating sales on the larger accounts—has been used effectively by some manufacturers.

There may be possible economies at any one of a number of links in your marketing and distribution chain. Do you have a program for scrutinizing all these links regularly and carefully—and

with some imagination? In your sales force, will a smaller number of higher-priced, high-quality salesmen serve you best, or can you make out better with a larger number of lower-paid salesmen?

Will your trade customers settle for less attention and fewer frills in return for some benefit they can share? In one company covering the country with a high-quality sales force of 10 men, the president personally phones each major account every 6 mos. As a result, distribution costs were cut, customer relations improved.

Distribution costs are almost bound to increase in the sixties—and you will never know what you can do to control them unless you study each element and experiment with alternative ways of doing the job.

► **Higher Costs of Advertising and Promotion.** From the manufacturer's point of view, the increasing cost of advertising and promotion is a very real problem to be faced in the sixties. It is accentuated by the need for preselling goods, and by private label competition.

How much fundamental thinking and research has your company done on its advertising program? Are you following competition willy-nilly — trying to match dollar for dollar—or are you experimenting with new means for reaching and influencing consumers? Have you evaluated the proper place of advertising and all phases of promotion in your total marketing program—from the standpoint of effort, money, and effectiveness?

► **Increasing Tempo of New Product Development.** Practically all forecasts mention new and exciting products on the horizon. Will you be out in the market place with some of these sales-building new products?

If competition beats you to it, this exciting new product era can have real headaches in store. On the other hand, the process of obsoleting an old product and introducing the new one is usually mighty expensive. As markets become larger and marketing more complex, the costs of an error become progressively larger.

Is your R&D or product development program tuned in to the commercial realities of the market? Are there regular communications from the field, or meetings of sales and marketing personnel with R&D people? **Technical knowledge is a wonderful thing, but it's useless unless it eventually feeds the cash register.**

Are there individuals in your organization who can shepherd a new product through to commercialization; who can develop reliable estimates of sales volume, production, and distribution costs; and translate the whole into profit and loss and balance sheet figures which management can act on with some assurance? We have seen good new products shelved because no one had the assignment to develop such facts and plans — and management couldn't make up its mind.

"Is your R&D tuned to commercial realities? Technical knowledge is a wonderful thing—but useless unless it feeds the cash register."

3. Problems in Marketing Management

► **Shortage of Skilled Salesmen.** There is a shortage of salesmen today. In the future, quantitative demand will be greater because of the expansion of the economy, and the qualitative need will be greater still.

While many companies have done fine work in developing sales personnel, much of it has been product rather than sales training. Nor has the training been enough in relation to the need. Most marketing people agree it is going to take redoubled efforts to satisfy future requirements.

Have you estimated your sales manpower needs for the future (both quantitatively and qualitatively)? Has your company developed selection and training processes that are geared to providing the caliber of salesmen you will need in the next 10 yr.?

► **Shortage of Sales Management Talent.** With the growing complexity of markets and intensity of competition, sales management, whether at the district, region or headquarters level, is a tough job today—and it will be tougher in the future. Men qualified for the broader task of marketing manager are even more scarce due to the demanding combination of qualifications called for by this type of management work. The growth of business has outdistanced the available supply, and the demand will continue to exceed the supply in the sixties.

Does your company have a program for selecting and developing sales and marketing management personnel for the longer term? Does your management climate and your management compensation plan attract and keep top-notch marketing people?

► **Complexity of Complete Marketing Planning.** Every single problem touched on thus far is related to good marketing planning. "Hip-pocket" tactics are going to be harder to apply. Many food and beverage companies are already on a highly planned basis. They have to be. With greater investments in plant facilities, with automation growing, you can't switch around, either in volume or in product design, as much as was formerly possible—or at least not as economically.

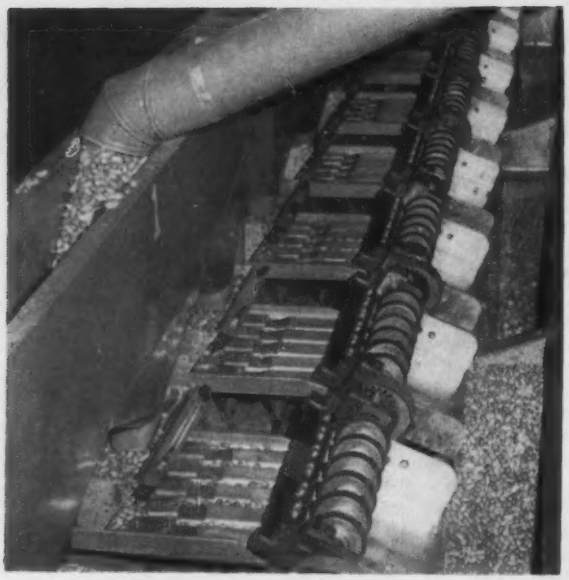
Are planning and strategy development emphasized sufficiently in your company? We find too many sales and marketing executives so burdened with detail that they are short-changing planning.

Are annual marketing plans reviewed throughout your management group to get the perspective of all individuals and get everyone on the marketing team? Do you have a long-term (5- or 10-yr.) marketing program?

The key to effective marketing is wrapped up in defining your company's marketing problems realistically. Solutions frequently suggest themselves when you accurately pinpoint your problems, whether they be in the market, in marketing methods or in marketing management.

If companies will take the time to give objective consideration to their major problems and to the questions they provoke, then a long constructive step will have been taken toward more effective marketing in next decade. (End)

RAZOR BLADES in six pairs of spring-action holders cut peanut skins on both sides.



BLADES IN PLACE receive nuts in single file from vibrating troughs. Rollers move nuts between blades.

Ingenuity Creates New Process

Automatic razor-sharp cutter and hand-like peeling device spark new custom nut blanching business. Factory and all operations advanced

INVENT a better way. House your unique process in a new building tailored to efficient operation. Guarantee fast, reliable, high-quality performance.

Then you can sell your service to other food processors. It can save them time and money and improve quality.

Seabrook Blanching Corp., Edenton, N. C., has done just that.

There is no other food plant in the world like Seabrook's. And it is all built upon ingenious ideas.

Developed to practical perfection by James W. Gardner, Seabrook's president, those ideas constitute a better process for water-blanching shelled peanuts.

Blanching peels the tough, tight-fitting skin from the raw nut. There are two major ways. Conventional technique involves heating to about 280F. for 25 min. to loosen the skin. Unfortunately, this promotes migration and rancidity of oil in the nut. It causes loss of oil and 12% shrinkage. What's more, the rough handling of the nuts through rolls to remove the skin may produce 20% or more splits.

Seabrook's water blanch, on the other hand, does not promote rancidity or loss of oil, gives only 6% shrinkage, and keeps splits to 10% or less.

FRANK K. LAWLER
Editor, "Food Engineering"

How Nuts Are Blanched

It's easy to expose nuts to hot water. The difficult part is to remove the skin even after this softening-up exposure. You can do it by rubbing the nut between forefinger and thumb. Seabrook does it similarly, but mechanically at a rate of 3,000 lb. of nuts an hour. (Capacity soon will be 6,000 lb.)

Herein lies the ingenuity of Mr. Gardner's invention. Nuts feed in a continuous stream between two rollers, a lower one with serrated V-groove and a top one of soft sponge rubber. These rollers pass the nuts between two spring-opposed razor blades that cut the skin along both sides of the nut. And a lug on the lower roller frees the blades of any nuts that stick.

The rolls are grouped in gangs of six, and three gangs are supplied from one bin through adjustable-speed vibrating feeders. There are 16 bins and 48 gangs of rolls for an hourly throughput of 3,000 lb. of nuts, and the num- is being doubled.

All of these machines are tended and maintained by one girl. And her principal function is to replace the razor blades every 6 hr. These blades, incidentally, are made by breaking a double-edge safety blade into four pieces with a special tool. And the pieces are held in the cutters by spring clips for quick replacement.

Equally ingenious is the mechanical substitute for the thumb and forefinger that rubs the split skins from the nuts. After passing through sprays of very hot water, the nuts discharge onto a special neoprene belt with conical

OSCILLATING foam rubber pad gently rubs nuts against pebbled belt to remove cut skins after hot-water spray.

bumps, or pebbles, on it. Here the nuts are rubbed by a 160-per-min. oscillating foam rubber pad covered with polyethylene and canvas and actuated by a metal arm. Only work here is changing rubbing pads every 6 hr.

The freed skins stick to the wet belt, travel under during return pass, and are knocked loose by a vibrator.

There are 16 hot-water spray boxes and rubbing units, and another 16 are under construction to double capacity to 6,000 lb./hr.

Uses Special Driers

Removing water from the nuts without heat or physical damage is another achievement. Mr. Gardner designed this equipment, too. First the nuts pass through a predrier, where a blast of hot air rapidly removes moisture from the surface. Outside air brought in via gas-fired heater is mixed with dehumified air from steam-coil heaters then blown through predrier.

The nuts travel gently through the unit on three screen-wire belts, 4 ft. wide and 25 ft. long, arranged one below the other. Capacity is a huge 6,000 lb./hr.

Next the nuts go through two slow-action warm air driers in series, these being similar to the predrier.

Uniform air flow is achieved in the big drying units by a series of ducts that enter the sides at several carefully selected points.

Dehumidifies with Alumina

Efficient drying in damp weather is permitted by dehumidifying the air in a McGraw-Edison Lectro-dryer. The air passes over trays of aluminum oxide which absorb moisture, then over cold-water cooling coils.

ELECTRONIC SORTER kicks out improperly blanched or discolored nuts.

Reactivation of the wet alumina is automatic. The dehumidifier is built in two sections, and the alumina in one is reactivated with hot air while that in the other is absorbing moisture. A Geneva valve regulates the 34-min. cycle.

After final drying, the nuts go through cool air in another wire belt unit similar to driers. And to save Btu., the air warmed by cooling is utilized in the warm air driers.

In the drying-cooling sequence, nuts are tailored to a moisture content of 5 to 6% if they are for roasting and salting. But a moisture range of 3½ to 20% is attainable as desired.

Leaving the cooler, the nuts are belt-conveyed through a vacuum-cyclone air separator for final cleaning. Then they are electronically sorted to remove nuts with skins still on them, or that are discolored. The vacuum fingers of each Electronic Sorting Machine pass 200 lb. of nuts an hour under a photoelectric scanner. There are 16 of these machines in operation, with another 16 being installed.

Rejects are passed via conveyor belt before two girls for manual inspection. They pick out the worst for use as oil stock, and the others are reblanched.

Advanced to the very end, Seabrook's plant has an electronically controlled, dual-feed carton filler. A fast vibrating feed conveyor pours nuts into 50-lb. cardboard containers on a Howe conveyor scale. As near-fill is reached, a dribble feed takes over. If exact fill is not achieved, a buzzer sounds. Then the operator can feed a few more nuts into the case by pushbutton.

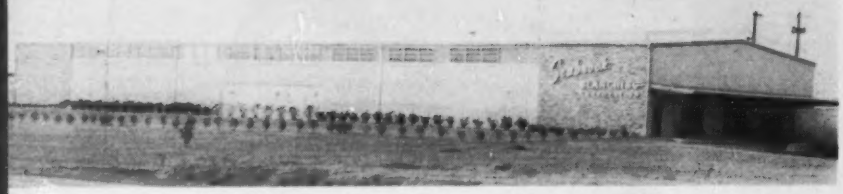
One man can operate this weigh-fill operation, compared to two or three for conventional bulk-carton filling. And accuracy is much greater because the human element is eliminated.

Now ready for shipment to their owner, the packaged nuts are stored in one of six rooms. Each of these rooms will hold a truck load to make shipping control easy and coordinate it with incoming loads.

Keeps Close Tab on Loads

Meticulous control is essential because the plant receives and processes truck loads of nuts owned by other firms, then moves the loads on to owners. Trucks

ELECTRONICALLY actuated vibrating feeders accurately fill (fast, dribble) finished nuts into cartons on weigh conveyor.



ADVANCED DESIGN makes Seabrook factory attractive and functional. Nuts are received at right end, pass through blanching operations, are loaded on trucks at other end. Aluminum panels in front are topped by windows and colorful plastic panels.

bring the nuts from shelling plants in the area, and the loads go through the blanching plant enroute to the owners' factories.

Quick, dependable service is a must to avoid delay in the flow of raw material. That is why the plant has three receiving rooms, each with a capacity of one truck load of bagged, shelled nuts. Each load is handled separately all the way from receiving, through blanching, to shipping. And there is a 30-min. break between loads to empty equipment.

Received on a canopy-covered platform, the bags of nuts are unloaded by hand truck and weighed in on a platform scale. When the load is in its private receiving room, an "identification" card is placed on the door.

First step in blanching is to convey nuts through a dry cleaner where filtered air blows out dust and chaff, and vibrators shake out heavy objects such as stones. The nuts are then belt conveyed to bins supplying vibrators feeding the cutting operation.

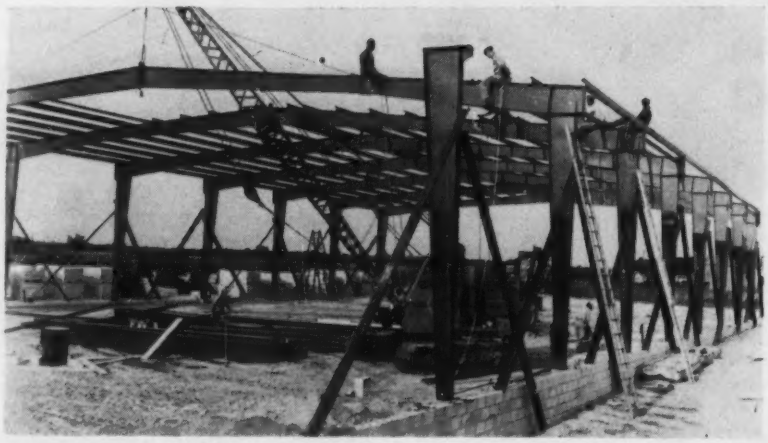
Ingenuity enters here in the form of a bin level indicator of the pressure type. It shuts down all operations ahead of the bins if necessary to avoid overflow.

Minimizes Downtime

Ingenuity scores again in a panel of operation tell-tale lights in the plant manager's office. If any line shuts down, the manager knows immediately and can take corrective action.

Equally practical, the manager's office is located at mezzanine level to permit him to observe plant operations through his windows.

All of this is part of extensive protection against production delays. Management wants down time to be infrequent and to be cut short when it occurs. That's why the plant has a spare for every vital part. Why electrical contacts flash lights when a dryer or cooler belt is getting out of alignment. Why Mr. Gardner designed a bench for quick cutting of drier replacement belts. And why preventive maintenance is systematic.



UP IN 5 DAYS, this Butler steel frame supports roof and walls of 240 x 80 x 20-ft. structure. Vertical beams are anchored in concrete footings. Roof went on in a week. Plant was operating in 11 months.

Pinpoints Quality Control

No less a fetish is made over quality control. When a load comes in, a set of papers is made up by the lab technician. The set includes these reports: Incoming Product, Receiving and Laboratory, Blanching Department, Sorting Department, and Finished Product, plus the Bill of Lading. Then there are Extraordinary Report sheets for the cutting, blanching, drying, and sorting departments.

The incoming product report goes to the customer to inform him about the quantity and condition of the load. The Receiving and Lab Report is for Seabrook's records. The department reports are for time, quantity, and process information. The Extraordinary Reports cover unusual incidents in any department. The Finished Product Report contains information for the customer, such as weight received and shipped.

The laboratory technician posts the sheets on the clip board of each department. Then tests for entries on the sheets are made periodically in each department.

Building Is Unique

You can take tips in building construction and services from Seabrook, too. The steel frame for the Butler building went up in 5 days; the roof went on in a week. Everything was up and the equipment in operation 11 months after breaking ground.

Vertical columns of the steel frame are anchored in cement footings and cross-braced with tie-rods. Steel cross beams support the roof to provide column-free space in this 240 ft. long, 80 ft. wide and 20 ft. high factory.

Floor is a solid concrete slab, with expansion joints between floor and walls all around. Practical roof is of corrugated aluminum, with 2½ in. insulation and with vents at apex.

Unique front wall panels are a sandwich fiberglass insulation between thin sheets of aluminum. Office expansion section in center of front wall is concrete block, back wall is block, ends are brick.

Bright interior colors help keep personnel cheerful. The scheme is pastel yellow on cross walls, and pastel green the long way. Idea is that green walls rest eyes when employees look up. Yellow contributes brightness.

Efficiency is carried into plant services, too. Electric power is 3-phase, for example. And all motors are 3-phase. This lowers power costs.

Investment in this modern factory and equipment is about $560,000. (End)

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Science and Food

Today and Tomorrow

Problems, progress, and prospects spotlighted in analytical symposium by experts from industry, government and science

FAULTS were criticized, progress reported, and the future forecast at the symposium, Science and Food: Today and Tomorrow.

Top authorities from food manufacturing, FDA, nutrition, medicine, and chemical processing participated in an analytical program sponsored by Food Protection Committee on December 8.

Darby—Adaptation of food to changing demands must continue. But it is the responsibility of industry to assure progress without sacrifice of nutritional values or increased hazards. So warned William J. Darby, head of nutrition at Vanderbilt University and chairman of Food Protection Committee.

Disappearance of the old distinction between agriculturally and industrially produced foods is foreseen by Darby as inevitable. And boundaries between the two are dissolving rapidly.

Dawson — Maintenance of our rate of progress will not be easy, in the opinion of David H. Dawson, Vice-President of du Pont. But basic fields of study promise great advances. One is the chemistry of life processes in living cells. Another is perfection of evaluation procedures.

A better understanding of life processes in cells would bring us closer to prescribing molecular formulas to fit given biochemical needs, Dawson observed. These might be aimed to promote desirable biochemical effects as in nutrition, regulation of growth, or influencing genetic factors. Or they might be aimed to inhibit undesirable forms of life, such as harmful bacteria and viruses, fungi, or predatory insects.

Understanding biochemical activity in cells also would help to solve major problems in respect to safe levels of synthesized chemicals. It might allow us to simplify, or even to eliminate, the present cumbersome procedures of bioassays with laboratory animals.

In testing with laboratory animals, it is not possible to demonstrate the absence of any effect at all, Dawson pointed up. Toxicity is not a specific measurable characteristic.

And our analytical procedures cannot prove an absolute zero—only less than can be detected.

Need for greater analytical accuracy is basic to all fundamental studies. One example of an advance is a technique developed at du Pont. It measures the nutritional balance of food protein by sampling the blood after feeding a test meal and determining the changes in levels of plasma amino acids. This technique demonstrated that some food proteins were quite inefficient.

Dawson emphasized that progress depends upon the willingness of the chemical and food industries to support research and to take capital risk.

Unfortunately, the willingness to risk capital has been subtly but profoundly influenced by changes in legislation and legislative climates which have developed in the past several years.

The desire to zero risk with food additives is a deterrent to progress. Risk should be minimized. But it should be weighed against benefits.

"The problems involved in increasing food supplies faster than population growth are of such magnitude that we need to accelerate, not hinder, their solution," Dawson stated.

A basic problem is to convince the public that government should consider risk versus gain.

Dawson reported that the expense of establishing safety is in the order of a half of a million dollars for a single product and involves testing for several years.

These costs, of course, must appear in the price of the product. Also, the requirements of recent legislation have slowed the pace of research.

King—The health of our population is efficiently protected by an attractive food supply. And this is a major factor in our increased economic strength, said C. Glen King, Executive Director, Nutrition Foundation. Classical deficiency diseases—such as rickets, scurvy, pellagra, goiter, sprue, and chielosis — have practically disappeared except for individual cases of gross personal neglect.

King stressed that all materials in food should be evaluated nutritionally in three zones of quantity:

(1) No significant biological effect observed. (2) Biological effects evident. (3) Injury clearly evident.

"The need for lay as well as professional personnel to recognize the validity of this viewpoint is important in establishing regulatory policies, in agriculture, in

FRANK K. LAWLER
Editor, "Food Engineering"

Tissue culture permits study of food additive effects in test tube—Larrick
Opportunity for institutional foods with built-in chef service —Mortimer
Will be no distinction between industrial and agricultural foods—Darby
All materials in food must be evaluated in three ranges of quantity—King
Understanding biochemical activity in cells will solve major problems—Dawson
Must find ways to help other peoples of the world technologically—Harrar

education, and in formulating advertising claims," observed King.

Effect of fats in the diet is something to which food scientists in the industry are alert, King noted. But closely akin to that problem is the search to discover how calories, minerals, sugars, vitamins, and proteins affect fat utilization.

Scrimshaw — Accelerated progress in meeting the deficiency of good quality protein foods in underdeveloped countries is extremely important. This was pointed up both by King and by Nevin S. Scrimshaw, Director, Institute of Nutrition for Central America and Panama.

The latter revealed that in Guatemala nearly 40% of children dying at age of 1 to 4 yr. suffer from kwashlorkor. This is caused by poor nutrition at time of weaning, making the children susceptible to stress of infection and stunting growth.

A low-cost, high-nutrient food formulated in the United States has brought significant changes overnight in some areas, Scrimshaw stated. Milk can produce dramatic changes. Fish meal, eggs and a properly selected vegetable mix are good too.

Harrar — Serious need for improving nutrition in underdeveloped countries also was stressed by J. G. Harrar, vice president of Rockefeller Foundation. Biggest problem is to transfer some of our know-how.

Unless we find ways to help other peoples of the world technologically, our future will not be bright, in Mr. Harrar's opinion.

Food Man Looks Ahead

Mortimer—Americans need understanding, as never before, about the abundance and wholesomeness of our food supply. That was the deep conviction expressed by C. G. Mortimer, Chairman, General Foods Corp.

Nutrition Foundation has authorized an information program to bring to the general public knowledge about nutrition in lay terms. This program is viewed as a catalyst for uniting all segments of the food industry in a public service undertaking that is bound to reflect to the credit of all who help sponsor it, according to Mortimer.

Other challenges to the food industry are seen by Mortimer in trends in today's living. These include demand for convenience items and quality.

The housewife of tomorrow will be increasingly sophisticated in her selections and more alert to her family's nutritional requirements.

Mortimer cited his firm's instant baby foods as an example of progress. These are partially dehydrated and frozen, and are sold in aluminum-foil envelopes. The 23 items in the line are marketed on a limited basis. They are well received by pediatricians and mothers alike, according to Mortimer. The line is particularly significant because of its high nutritive content, fresh flavor, good color, and vitamin retention.

"We shall see many freeze-dried foods on grocery shelves when and if scientists lick the problem of present high cost of the process," Mortimer forecast.

Particularly intriguing are Mr. Mortimer's estimate of opportunities in the institutional field. Processors may find a way to offer an entirely new kind of service to restaurants. Their products could incorporate not only the services of the kitchen maid, but also of the dietitian and the chef. These services would all be built in at the factory.

This possibility of providing "chef service" is being studied at General Foods.

Mr. Mortimer sees an opportunity to provide mass feeding institutions with a variety of appetizing, well-balanced, nutritional meals.

These would help hold the line against preparation costs.

Davidson — Closer working ties between physicians, the food industry, and nutrition scientists might accomplish a great deal. That point was emphasized by Charles S. Davidson, Thorndike Memorial Laboratory, Boston City Hospital. The Council on Foods and Nutrition acceptance program no longer is in force. So physicians and others pursuing the American Medical Assn.'s columns no longer can learn about the food produced specifically for low-sodium diets, Dr. Davidson pointed out.

Information on effect of fats in the diet is another area in which

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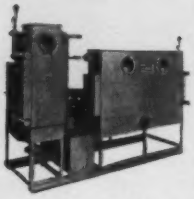

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physicians are confused, according to Davidson. And more information is needed about food for aging persons, and for infants.

So a major problem for the food industry today is the provision of information for the physician—on the composition of foods and their utility as special-purpose foods and their use for special diets.

Smith — Potential hazards are associated with food additives. But these can be controlled through knowledge and common sense. Every potential social advance presents alternatives imposing value judgments which cannot be avoided except at the risk of stagnation. Those important points were made by R. Blackwell Smith, Jr., President, Medical College of Virginia.

FDA Head Cites Gains

Larrick—"Nowhere has a developing technology had greater impact than upon our food industry," stated George P. Larrick, Commissioner of Foods and Drugs.

It can be truly said that applications of science and modern technology have made our food supply the most abundant and diversified in the world.

Larrick cited significant improvements in analytical equipment and techniques.

Outstanding among these was tissue culture, which permits growth and reproduction of human and animal cells in an artificial medium.

Then the effect on growth of a variety of chemicals (such as food additives) may be observed in what is essentially a test-tube manner. Sometimes nutritional changes too subtle to be detected in the intact animal may be noted.

Another significant new technique is testing for residues of chlorinated organic pesticides by means of bioassay using house flies. Flies react to virtually all organic pesticides. And fly-toxicities of many of these parallel their mammalian toxicities in a remarkable manner.

Metabolism and other bio-chemical procedures may be capable of detecting adverse biological effects long before any pathology appears, Larrick said.

Micro-biological procedures—the use of bacteria as test animals—may be useful in this area. Such procedures might be substituted for long, costly animal feeding tests. (End)

ANOTHER REASON FOR CHOOSING
OWENS-ILLINOIS CORRUGATED BOXES·

MR. STRONGBOX
An Owens-Illinois trademark

How Owens-Illinois corrugated boxes cut product damage 13%

LOCALIZED SERVICE FROM:

Atlanta, Ga.
Aurora, Ind.
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Detroit, Mich.
Flint, Mich.
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Long Island City, N. Y.
Los Angeles, Calif.*
Madison, Ill.
Memphis, Tenn.
Mercedes, Texas
Miami, Fla.
Milwaukee, Wis.
Minneapolis, Minn.
Newark, N. J.
Oakland, Calif.*
Salisbury, N. C.

*These plants operated by National Container Corporation of California, subsidiary of Owens-Illinois.

The right degree of product protection is the *first* concern of our packaging engineers.

Example: Damage from bruising during handling and shipment of new spring potatoes resulted in 15% loss. Owens-Illinois designed a corrugated potato box that reduced this loss from 15% to less than 2%.

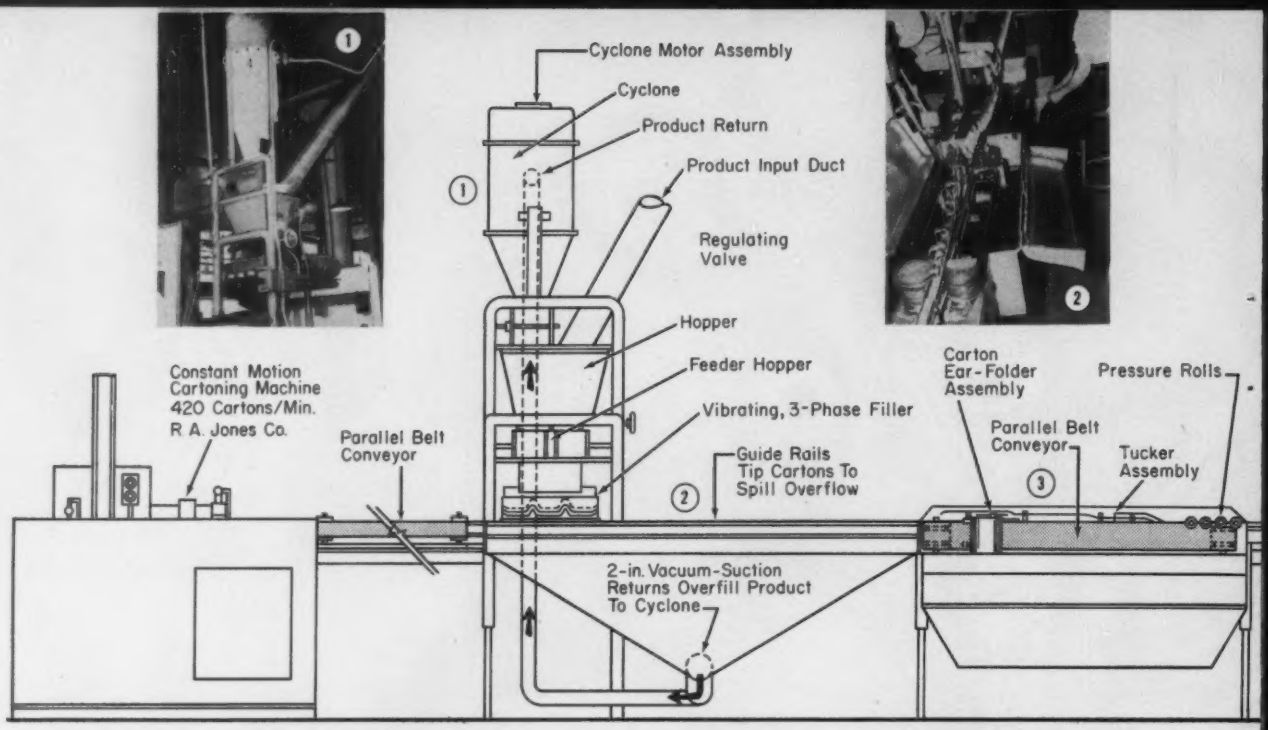
Result: Substantial savings without *overpacking*, which can cost more than the damage it prevents.

From potatoes to missile components, our packaging engineers design product protection *and* economy into corrugated boxes.

We have a plant near you and if Owens-Illinois can't package your product in corrugated, nobody can!

PAPER PRODUCTS DIVISION
FORMERLY NATIONAL CONTAINER

OWENS-ILLINOIS
GENERAL OFFICES · TOLEDO 1, OHIO



SUN MAID's packaging line operations: (1) **Input duct** discharges into filler's hopper; measured flow, drops on vibrating, 3-phase filler pan; surplus from overfill dumped and recirculated. (2) **Guide rails** tip cartons, excess fill drops off and leveled cartons move to . . . (3) **high speed tucker** which closes at 420/min. (4) **Six-pack accumulator**, syn-

Plant Designs Own High-Speed

Four new lines have 67% greater capacity compared to former 14 lines. Also reduce direct labor and materials costs.

"ALL-OUT" PACKAGING ENGINEERING is continuing to show impressive results at Sun-Maid Raisin Growers of California (see previous feature in FE Oct., 1960, p. 100).

We were faced with a problem, not uncommon in some branches of the food industry. Machinery manufacturers' attention is centered largely on the development of equipment that can be standardized and offers a potential volume sales. Packaging machines for our 1½-oz. carton were relatively nonexistent. In this "neglected area" there is only one solution for improvement of machines—design and build them yourself.

Formerly there were 14 lines. Each required an operator and each had a capacity of 72 cartons/min. With the exception of 3 units purchased from equipment manufacturers (see diagram), all units in this line were designed and fabricated by Sun-Maid. With a 5¢ item the saving of even a fraction of a cent in costs is significant in ultimate profits.

The present four new lines: Reduce labor cost by 50%; increase production capacity to 420 cartons/min.; achieve a fill tolerance of ±1/16 oz.; reduce packaging materials costs; and, make possible the new 6-pack of 1¼ oz. raisins.

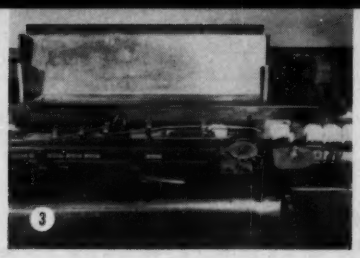
After experimentation, it was found that the constant motion cartoning machine operated most efficiently at 420/min.—which became the limiting factor in the line's capacity. This unit opens carton flats, glues side-seams and tucks the bottom ears and tops. The Sun-Maid equipment has the potential of operating at even double this speed.

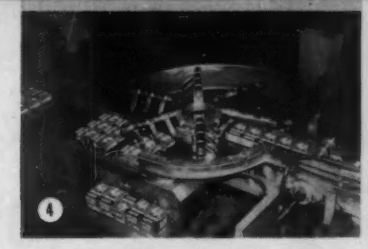
A parallel-belts conveyor, following the cartoning machine, provides the motive power to push empty cartons under the filler and across the overfill dump area. Here, another set of parallel belts, operating at twice the speed of the first conveyor, pushes the filled cartons through the carton closing unit and on to the 6-pack assembly unit. The increased speed of this conveyor separates the cartons by about 2 in., which is the space needed to fold efficiently the tuck-type cartons' ears and top.

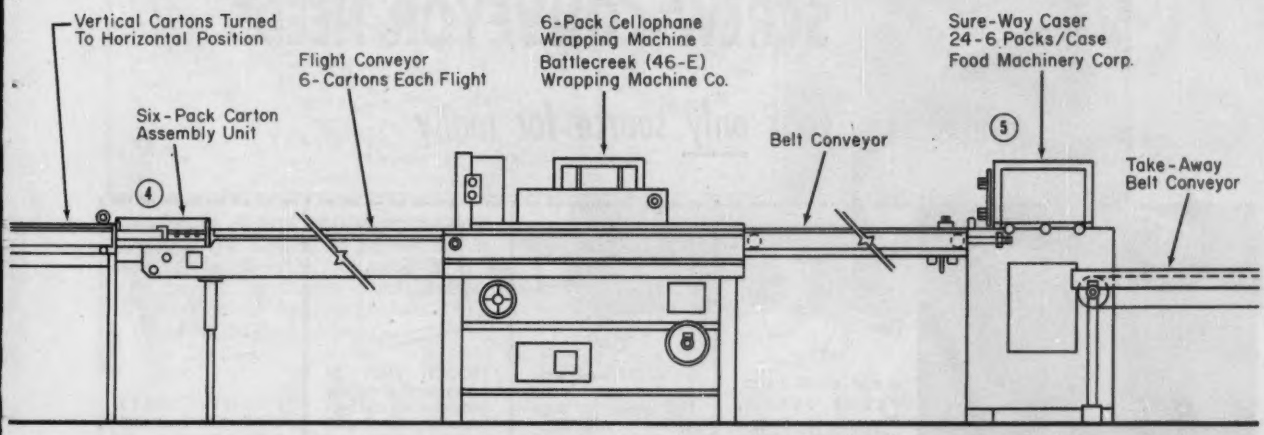
3-Phase Vibratory Filling

The Sun-Maid vibratory, volumetric filler operates on a 3-phase fill-rest principle. A bottom lip of the filler engages with the cartons' tops and, as they move across the filling area, they are vibrated to avoid product bridging and to settle the raisins in the container. Uniform volume-product flow to this

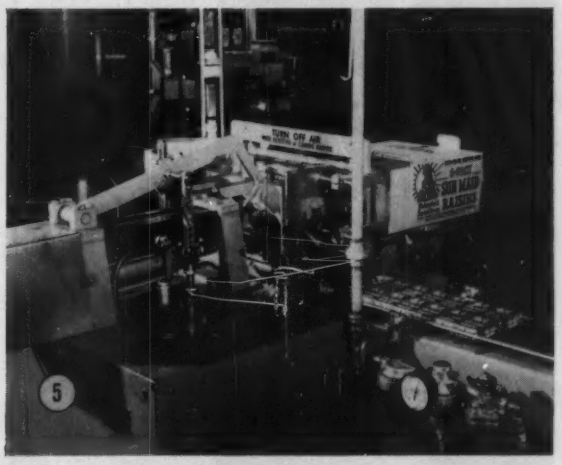
JAMES P. VOLLER
Chief Engineer, Sun Maid Raisin Growers, Inc., Fresno, Calif.






Vertical Cartons Turned To Horizontal Position
Six-Pack Carton Assembly Unit
Flight Conveyor 6-Cartons Each Flight
6-Pack Cellophane Wrapping Machine Battlecreek (46-E) Wrapping Machine Co.
Belt Conveyor
Sure-Way Caser 24-6 Packs/Case Food Machinery Corp.
Take-Away Belt Conveyor
4
5

chronized with take-away flight conveyor, moves cartons to wrapper and then to . . . **(5) automatic caser** (see photo at right).



SURE-WAY CASER automatically packs 24 six-packs in tiers of four, six high. Needs one operator to position empty case on mandrel.

Packaging Line

filler is achieved by a feeder-drum at the discharge of the feeder-hopper. Thus, as a carton passes under this filler the first chute fills it with ⅓ its volume; after "resting", the second chute fills it to ⅔ volume; and finally, this is repeated for the total fill by the third chute.

The angle of tilt of guide-rails, through which the cartons pass over the overfill area, is carefully gaged to dump only that product filled above the top edge of the carton. Each carton arrives at the closing unit with a level fill.

Product dumped from cartons falls into a hopper and is conveyed by suction up to the cyclone product-return. To avoid overfilling the main hopper, product from the cyclone is measured into it by a pocket-type regulator valve. A level-control in this hopper regulates product flow from the input duct.

The trailing-ear folder assembly comprises: A spring-loaded lockbar, a lower actuating star-wheel, and the upper star-wheel that folds the trailing ear down. This entire assembly is carton-actuated. Filled cartons are picked up by the faster parallel belts and as they move forward, in a split-second, they trigger the lock-bar to release the star-wheels, then strike the actuating star-wheel. The lower wheel is connected to the upper star-wheel by gears which drive it at a high rpm. As it revolves, it folds down the trailing ear. The lock-bar momentarily stops the wheels in proper position for folding the ear of the next carton. Stationary rails then fold the leading ear and tuck the lid into the carton.

As the single procession of cartons emerge from the tucker they are positioned horizontally and move to the 6-pack assembly unit where five bars are attached to a central rotating axle. Each bar is equipped with three spring-tabs. As three cartons enter the unit, they are picked up by the spring-tabs and moved to the flight conveyor whose speed is synchronized with the accumulator. Here they are assembled in lots of six each before moving to the wrapping machine.

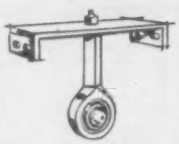
Six-packs are wrapped in 300 MST Cellophane. No trays are used. These unit packages are conveyed to the Sure-Way Caser which automatically assembles and cases them. Filled cases are sealed (Elliott Mfg. Co. case-sealer) and chuted to the shipping department where they are palletized. (End)

LINK-BELT is

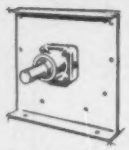
YOUR ONE SOURCE FOR ALL SCREW CONVEYOR NEEDS

your only source for many

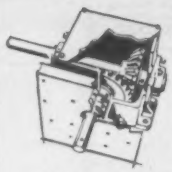
QUIK-LINK CONVEYOR SCREW. For ease in removal of conveyor section without disturbing other components. Can be furnished on Helicoid and Sectional flight conveyors.



HANGERS have wide top bar with slotted bolt holes for easy assembly and alignment. Available with self-aligning ball bearing or with sleeve bearing in babbitt, hard iron, bronze or oil impregnated wood.

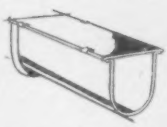


TROUGH ENDS of heavy steel plate are flanged at top and bottom. Furnished with babbitted, bronze or single or double ball bearing flange block, with or without trough end seal. Blocks are interchangeable.

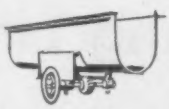


COUNTERSHAFT ENDS with ball and roller bearings or babbitted bearings, for right angle drive applications— common drive for two conveyors at right angles.

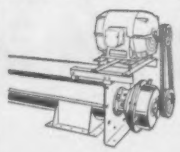
TROUGHS are accurately formed and jig-assembled. Steel angles securely welded to trough plate form top flanges. Can be made of stainless steel or other special metals to suit specific requirements.



SEMI-FLANGED, SPRING CLAMP COVERS are more rigid, easier to handle and form a tighter seal than plain type cover. Spring clamps are attached to cover—simplifies installation.



DISCHARGE SPOUTS AND GATES can be located anywhere along length of conveyor trough. Gates can be flat or curved —hand or rack-and-pinion operated.



DRIVES. Link-Belt shaft-mounted speed reducers are simple, compact — can be mounted directly on trough end plate. Motogears and Gearmotors with roller chain drives can also be furnished.

With seventeen basic screw designs, and a full line of components, Link-Belt can furnish anything you need from a single component to a complete line of screw conveyor.

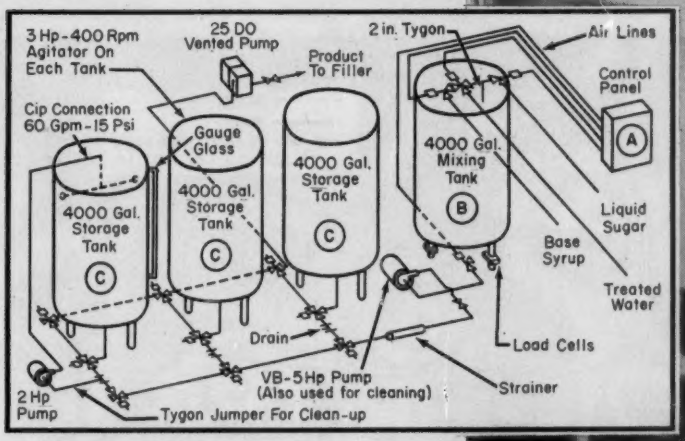
As the foremost producer in this field, Link-Belt offers a range of new product improvements for profitable operation. Quik-Link conveyor screws, hangers, trough ends with ball or sleeve bearings, jig-welded troughs with new semi-flanged spring clamp covers—these and many more are cutting power demands and maintenance costs.

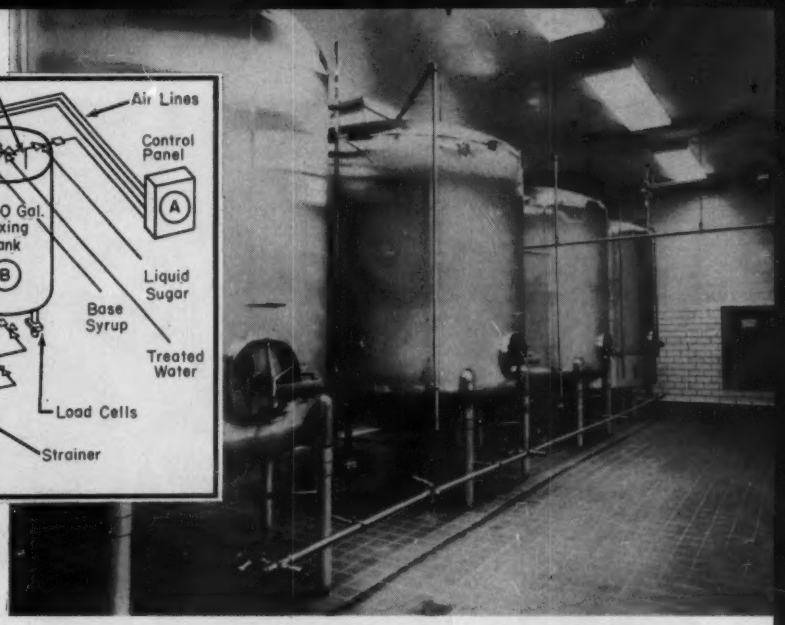
If you have bulk materials to be handled, it will pay you to look into the Link-Belt screw conveyor line. All components are available from stock. Call or write your nearest Link-Belt office or authorized stock-carrying distributor for Book 2989.

LINK-BELT

SCREW CONVEYOR

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Warehouses, District Sales Offices and Stock Carrying Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs; Switzerland, Geneva. Representatives Throughout the World. 15.230





AUTOMATED SYRUP PRODUCTION: From control panel (A), scaling of ingredients is regulated by remote control of valves and pumps. In sequence, ingredients from storage tanks (C) are metered into weigh tank (B), which is mounted on load cells.

Pushbutton-Controls Automate Liquid Batching

Sequential weighing of syrup ingredients, synchronized by load cells, saves time and labor, eases quality control and sanitation . . . Other uses seen

AUTOMATIC batch-weighing and mixing of three ingredients—liquid sugar, treated water, and base syrup keeps production, maintenance, and quality control men happy at Pepsi-Cola Bottling Co.'s Cleveland plant.

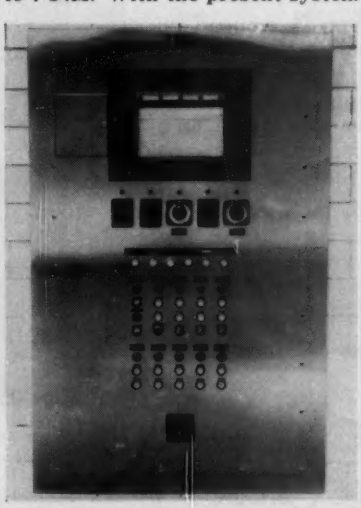
In sequence, the synchronized system meters the ingredients into a weigh tank equipped with load cells, also records individual and total batch weights. It monitors intermediate and final mixing cycles, then pumps finished syrup to storage.

Already in use for batching of ice cream mixes, system has broad industry application.

Production men like the system because syrup is made automatically. Formula information is easily visible on panel board, and each cycle is completed under pushbutton control.

J. V. ZIEMBA
Senior Associate Editor, "Food Engineering"

Formerly, 15 tanks (500 gal.) were used to meter in ingredients, which kept the day shift working to 7 P.M. With the present system (Cherry-Burrell's Load-A-Matic), job is done by 11 A.M. Moreover, system requires only four tanks (4,000 gal.) and a part-time operator.



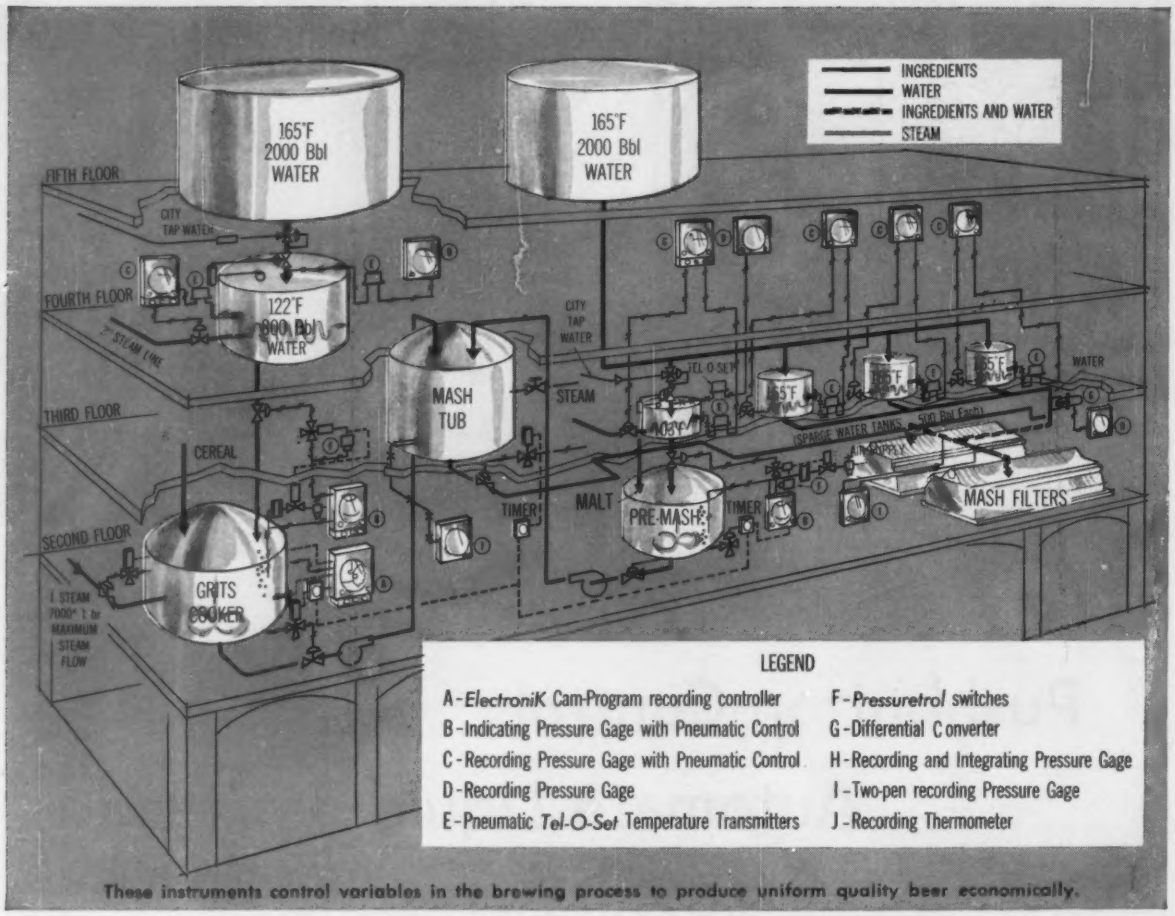
CONTROL PANEL actuates, times, and records all batching and mixing.

Maintenance men like the semi-automatic CIP arrangement by which tanks, valves, and pipelines are cleaned and rinsed without dismantling.

Quality-control men like the formulation accuracy. Ingredient proportions remain constant from batch to batch, because controls, once properly set, are locked to prevent deviation. In about an hour, a lab man makes all the checks necessary to provide data for setting the system's "Digisetters."

Pepsi's Installation

Of the four stainless-steel tanks, one—the weigh tank—is supported by three electronic load cells that weigh entering product. As it flows into tank, deflection of



These instruments control variables in the brewing process to produce uniform quality beer economically.

Ruppert's Beer brews better with Honeywell controls

At Ruppert's Manhattan brewery, which produces 250,000 gallons of high-quality beer a day, process control instrumentation improved on beer quality and uniformity. At the same time, this instrumentation solved the problem of maintaining full production even though work shifts were shortened.

The Honeywell-designed control system is grouped on two panels where temperature, pressure, liquid level and flow are all recorded or controlled. Control instrumentation is located on the cereal cooker, pre-mash tank, and sparge water tanks. Recording instruments are placed at convenient locations throughout the system. This combination eliminates any possibility of spoilage through errors in the brewing process.

Process control instrumentation brings many important savings to food processors. To learn what particular advantages it can bring to your own process, call your nearby Honeywell field engineer today . . . he's as near as your phone.

MINNEAPOLIS-HONEYWELL, Wayne and Windrim Avenues, Philadelphia 44, Pa. In Canada, Honeywell Controls, Ltd., Toronto 17, Ontario.

Honeywell

First in Control

SINCE 1885

Mortimer W. Brenner, vice-president and director of brewing, discusses instrument operation with Ruppert Vernon, vice-president of Ruppert Brewing Company. This panel, one of two control centers, has instruments for measuring and controlling temperature, liquid level, and time of the brewing cycle.

weight beam is electronically measured, and impulses are relayed to instrument panel for weight recording.

Cells also automatically control operation of sanitary centrifugals pumps and valves. This affords batching accuracy and instant shut off when weights are satisfied.

Control panel is mounted on wall adjacent to finished syrup-assembly tank. From the panel, operations are controlled, timed, and recorded. "Digisetters" are set for weight of each ingredient called for by formula, and pilot lights indicate "on-off" cycles.

Centrally located on panel are pilot lights, pushbutton stations, selector switches for starting and stopping pumps, and for transfer of product to storage-aging tanks.

Where Next?

System is also being used for preparation of ice cream mixes (FE July, '60, p. 44). Other food-industry applications might include weighing and mixing of:

. . . Eggs, oil, and liquid sugar in the manufacture of dressing products.

. . . Blends of beer, wine, oil, etc.

. . . Fruit and vegetable juice blends.

. . . Various liquid egg products.

. . . Chocolate and other liquids in candy manufacture.

. . . Liquid-ferment ingredients for bread doughs

How Synchronization Works

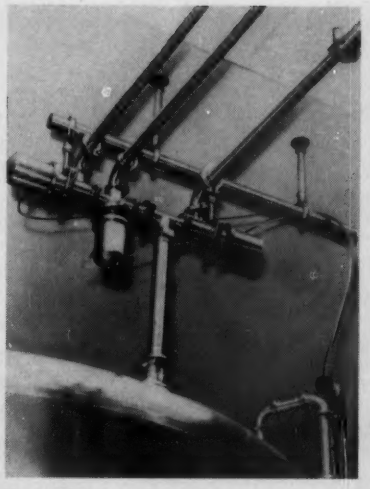
Operator presets required pounds of water, liquid sugar, and base syrup with "Digisetters" (40,000-lb. full scale), sets timers for two agitation cycles, and punches the start button. Then, in sequence, valves and pumps operate to meter water (10,600 lb.) and liquid sugar (26,200 lb.) into the weigh tank, and cut off exactly at the dial-in-weight.

At this point, controls automatically start a timed agitation cycle to assure complete blending of water and liquid sugar. After a 5-min. mix, an alarm alerts a lab man to check Brix of solution.

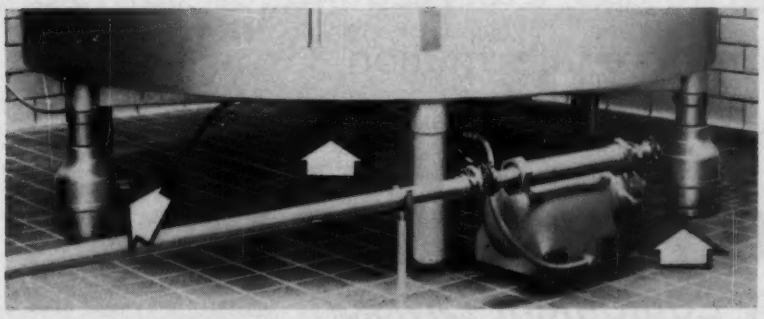
If Brix is correct, operator again jabs start button to meter the base syrup (2,600 lb.). Batch is mixed for another 5 min., after which an alarm sounds and agitator stops.

After a second Brix check, pump transfers finished syrup to storage-aging tanks, and shuts off automatically when weigh tank is empty.

Should Brix be off target (something yet to happen), operator simply makes manual weight adjustments by flicking switches to add pre-selected amount of necessary ingredient. (End)



SANITARY AUTOMATIC VALVES open and close in preset sequence during metering of ingredients into weigh tank.



WEIGH-BLENDING TANK, mounted on three load cells (arrows), weighs syrup ingredients. Cell impulses, transmitted to control panel, actuate system's pumps, valves, timers, and recorders.

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There's a *right* tool for every job. In foam control it's Dow Corning silicone antifoamers or defoamers . . . job-proved thousands of times over as the most efficient, most economical, and most versatile foam suppressors available.

*At prescribed levels, are sanctioned by FDA

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Please rush a FREE SAMPLE of a Dow Corning silicone defoamer for my product or process, which is (indicate if food, aqueous, oil or other): _____

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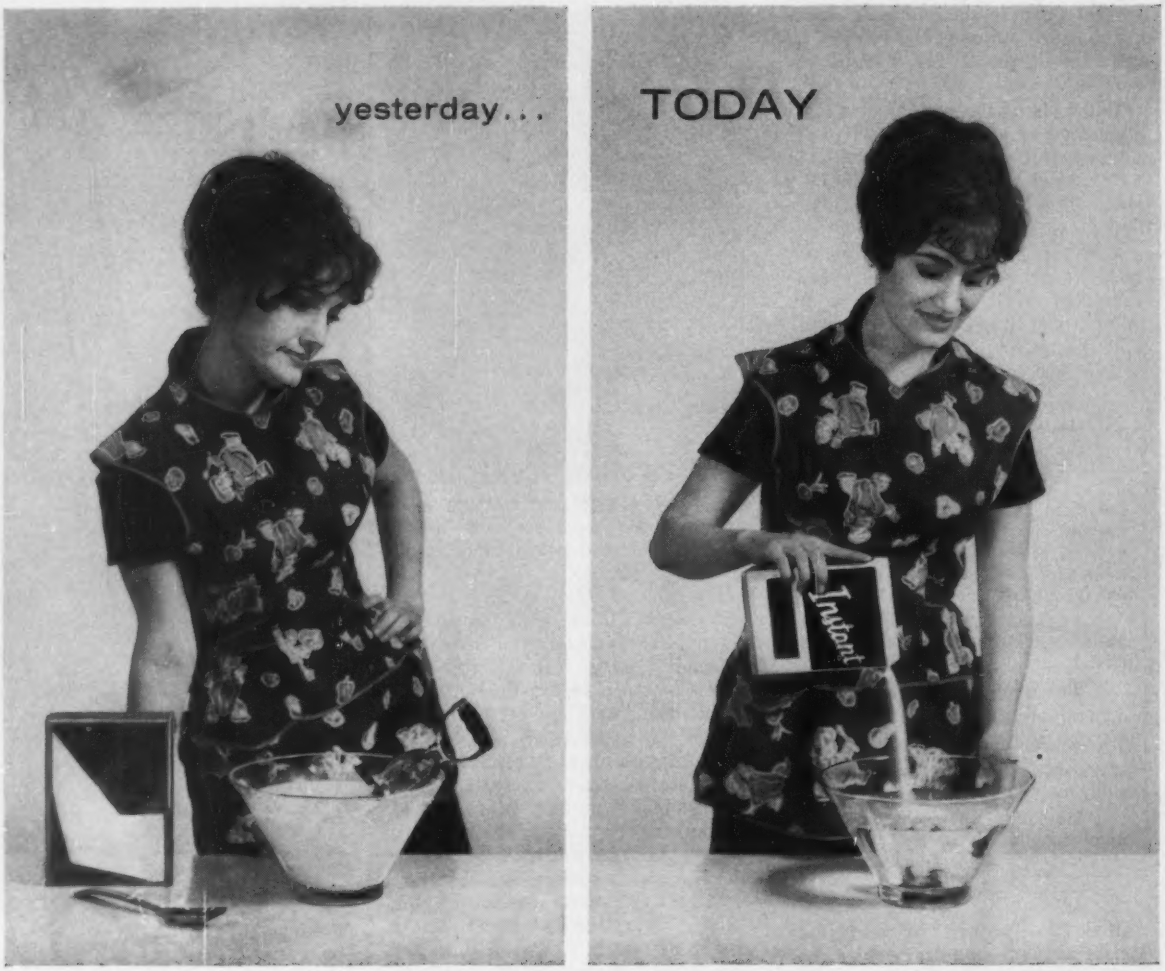


TODAY she will buy the one that's instant.

Many products can be made instant by using the new Blaw-Knox Instantizer. Perhaps your product can! Write to Mr. Jack Thomas, Dairy Equipment Division, Mora, Minnesota for more information.

BLAW-KNOX

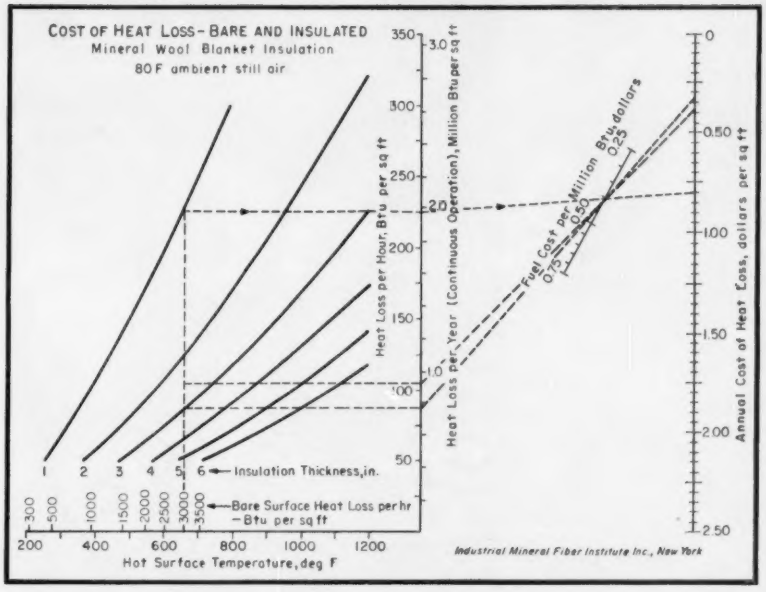
Dairy Equipment Division

MORA, MINNESOTA

practical ideas

Thickness chart for insulation . . . Eases can handling . . . Fertilizer melts ice

CHART SPOTS OPTIMUM THICKNESS FOR MINERAL-WOOL BLANKET INSULATION


COST OF HEAT LOSS - BARE AND INSULATED
Mineral Wool Blanket Insulation
80 F ambient still air
Heat Loss per Hour, Btu per sq ft
Heat Loss per Year (Continuous Operation), Million Btu per sq ft
Fuel Cost per Million Btu, dollars
Annual Cost of Heat Loss, dollars per sq ft
Insulation Thickness, in.
Bare Surface Heat Loss per hr — Btu per sq ft
Hot Surface Temperature, deg F
Industrial Mineral Fiber Institute Inc., New York

Here's an easy-to-use nomograph that quickly gives the most economical thickness of mineral-wool blanket insulation for all types of heated vessels.

To use graph, start at hot-surface temperature on scale at lower left and proceed vertically to given insulation thickness on curves at left. A horizontal line through this point intersects the vertical scale in the center. This point shows heat loss per hr. (Btu. per sq.ft.) and heat loss per year (million Btu. per sq.ft.) for continuous operation. Annual heat loss may be adjusted proportionately when operation is not continuous.

Follow with a line through heat loss on center scale and through cost per million Btu. on slanted scale to meet righthand scale at approximate annual cost of heat loss in dollars per sq.ft.

For each insulating job, hot-surface temperature and cost of heat are constant, so only insulation thickness can be varied if type of insulation and finish remain the same. Select several reasonable insulation thicknesses and determine the corresponding annual cost of heat loss with each. Knowing the difference in total installation cost for various thicknesses, the specific operating cycle, and depreciation rate, you can obtain the most economical insulation thickness. Of course, the graph can determine heat loss alone, from both bare and insulated surfaces.—*Industrial Mineral Fiber Institute, Inc., 441 Lexington Ave., New York City.*

FE Annual Editorial Index available upon request at 35¢ per copy

Keeps Candy Metal-Free

Helping maintain product quality at Walter Williams Candy Co., Oklahoma City, Okla., is this electronic metal detector—a self-contained unit consisting of two aluminum compartments separated by spacer blocks through which candy passes for inspection.

Upper compartment (detector section) houses a signal receiver and detector coil tuned to an oscillator circuit. High-frequency signals are generated by the lower oscillator compartment and a field coil, which provides field balance when no metal is present. Any metal particles passing within inspection aperture cause field unbalance, which induces a signal in

detector circuit. This energizes controls which operate rejector and conveyor systems. Detector can be reset automatically with a time relay or manually by pushbutton.

Supplied by Allis-Chalmers Mfg. Co., Milwaukee, unit can be mounted on an incline, horizontally, or

(Continued on Page 56)

CIRCLE 55 ON READER SERVICE CARD➔

IF YOU MAKE THESE PRODUCTS:

dry mixes, cookies, crackers, cakes, pies, soups, sauces, gravies, frozen pies, ice cream, sherbet, confections, macaroni & cheese—or most any product calling for non-fat dairy solids . . .

KRAFEN

(Kraft's spray-dried sweet whey)

WILL GIVE YOU THESE BENEFITS

Fine, True Flavor—Krafen's high milk sugar content and absence of casein works to bring out the natural flavor of all processed foods, frozen foods, ice cream, sherbets and baked goods—the flavor other dairy ingredients tend to mask!

For example, frozen food processors using Krafen no longer need "over-season" to maintain the flavor level.

Improved Eating Quality and Appearance—Krafen's combination of milk sugar and whey proteins gives added shortness and tenderness to all finished baked goods, whether ready-baked or from a mix . . . imparts finer texture and promotes a uniform, rich color and bloom.

Extended Shelf Life—Krafen's high moisture absorption and retention properties extend the shelf life of baked goods by a profitable margin.

Savings of up to 5¢ a Pound—Replace your present dairy ingredient with Krafen. Save up to 5¢ a pound on dairy solids costs and be assured of superior performance. Krafen—a high-quality, low-bacteria, low-acid dairy ingredient—is produced by Kraft in one of the world's largest, most sanitary whey plants.

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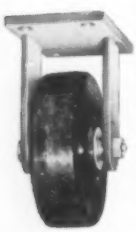

Molded Texite Wheels . . . were selected for use on these sanitary casters because they offer better floor protection, equal semi-steel wheels in load-handling abilities, are easily cleaned, shock resistant and impervious to most industrial chemicals, acids, etc.

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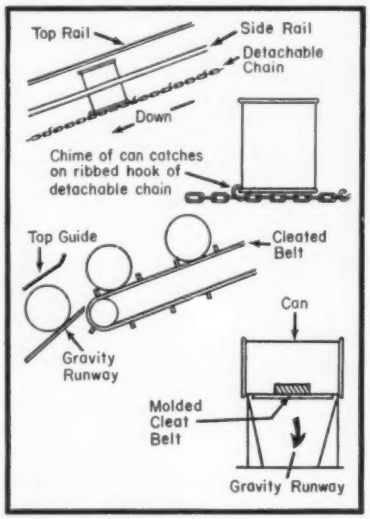
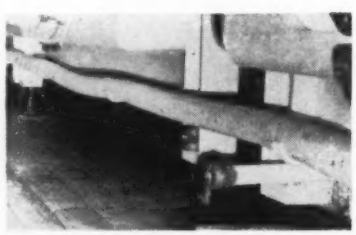
vertically anywhere within the processing line. Full sensitivity is attained at conveyor speeds of 15-600 ft. per min., and unit can be used for inspection of packaged as well as bulk candies.



Eases Can Handling

Lowering of large cans in steep declines without damage and use of long conveyors is a problem. Here are two suggestions that simplify it.

For lowering upright cans, a detachable link chain of proper pitch will prevent impact (sketch at left). For cans in rolling position, molded cleat-type belting can be used, as shown at right. Belt should be narrower than length of can, so that can rides on gravity runway as it leaves the cleat.—*J. Pocialik, Senior Application Engineer, Food Machinery & Chemical Corp., Hoopeston, Ill.*



Racks Keep Hose Off Floor

Hose racks installed on cellar tanks in our New Orleans brewery give us four important benefits:

1. Floors are washed faster and easier.

2. Floors dry faster, thus reducing the duration of a hazardous slippery condition.

3. Hoses are off the floor when not in use, which eliminates a tripping hazard.

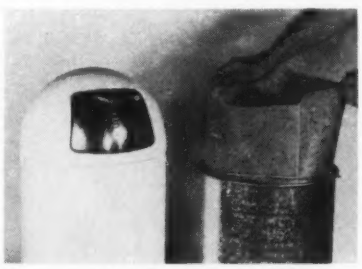
4. Contamination hazard is minimized because hose stays clean and sanitary when off the floor.

Racks are made of ¼-in. flat iron, 1½ in. wide and 15 in. long. As shown in photo, end of the bar is turned up about 2 in. Racks are welded to bottom of supporting beam and spaced to prevent hose sag.—*Joe Menendez, Safety Director, Falstaff Brewing Corp., St. Louis.*

Use Fertilizer to Melt Ice

While salt is effective in de-icing sidewalks, driveways, and other hard traffic surfaces in winter, it is very damaging to grass that grows alongside such surfaces.

Problem of damage to lawns has been solved by use of commercial fertilizer instead of salt. Its chemical composition (nitrate, phosphate, potassium) is such that it lowers the melting point of ice in much the same way as salt, and is beneficial to grass.—*FE Staff.*



Keeps Waste Cans Clean

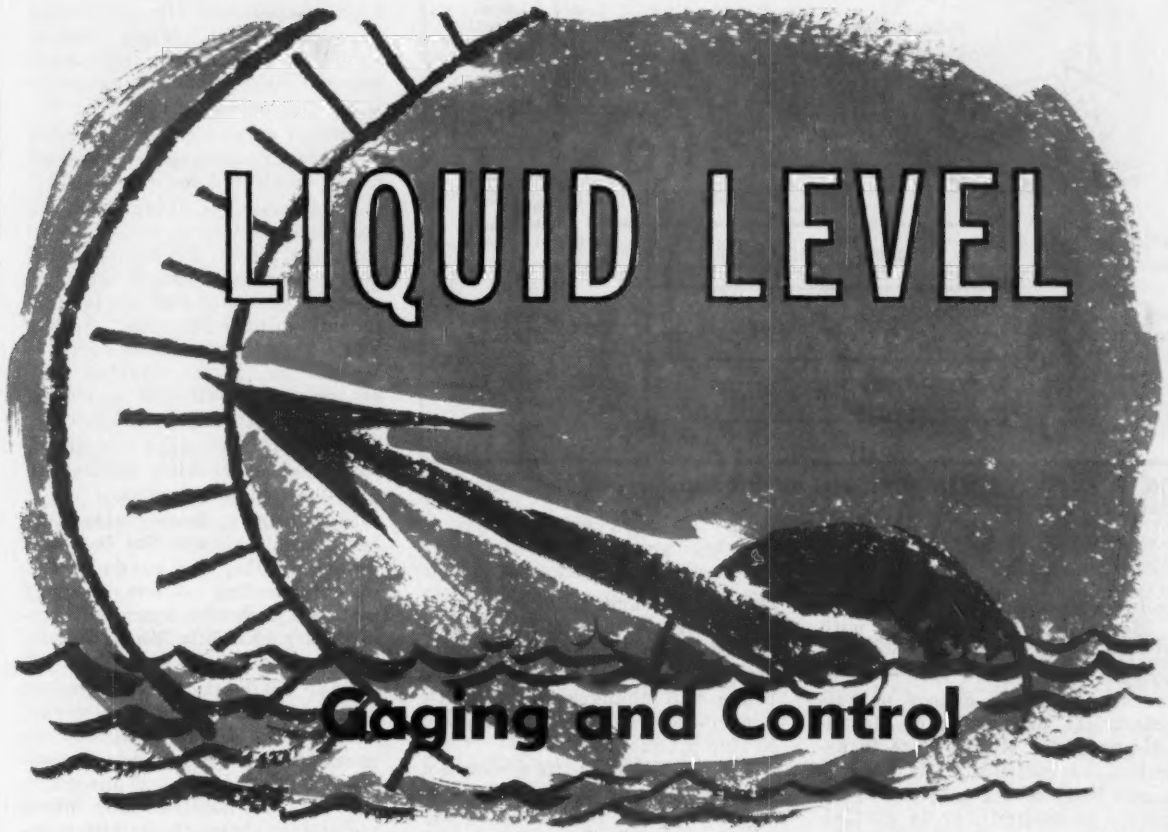
Waste cans remain clean, dry, and odor-free when lined with this heavy-duty waxed kraft bag.

It holds wet and dry waste, and when filled, can be removed without dumping or lifting the can. Samples are available from *Klean Kan Bag Co., 64 E. 8th St., N. Y. C.*

Curbs 'Skinning' of Paint

The dried-out surface layer that forms when a partly used can of paint is stored causes waste and inconvenience.

It can be eliminated, however, with a circle of parchment or wax paper cut to same diameter as can lid. When can is stored, carefully place paper on paint surface and reseal can. You just stir paint next time it's used.—*D. M. Graham, Greenville, Ill.*



At today's operating costs, precise control of products in process and storage is a must. Here are the latest automatic techniques and instruments for gaging tanks, hoppers, etc.

GAGING the level of material in a holding unit is fundamental in process control. You may want to know only whether a tank is full or empty. Or a slight variation in level may be critical. In any case some reliable method of measurement is essential.

Often you must take measurements continually —on incoming raw materials, products in process, and on tank-stored finished goods. Naturally, the more expensive the material handled, the greater the demand for accurate gaging. Tank diameter is another factor.

For example, in a 15-ft.-dia. tank, a gaging error of ½ in. represents 55 gal. of product. This is about the best accuracy attainable by routine manual methods, but electronic-type automatic tank gages generally are accurate to ⅛ in.

How do food processors gage liquid level? There are many devices—simple and complicated, inexpensive and expensive, slow and fast, reasonably accurate and almost exact, insensitive and sensitive, for corrosive and non-corrosive liquids.

How They Are Used

Range, nature of product, and operating conditions dictate the type of level gage to be used. Moreover, processors seek units that are simple, easy to use, relatively maintenance-free, low-cost, and sanitary. They are used indoors and outdoors, for open or closed tanks, and with liquids, slurries, or solids. Indicators may be located either directly at the tank or, for convenience, at a re-

FE Staff

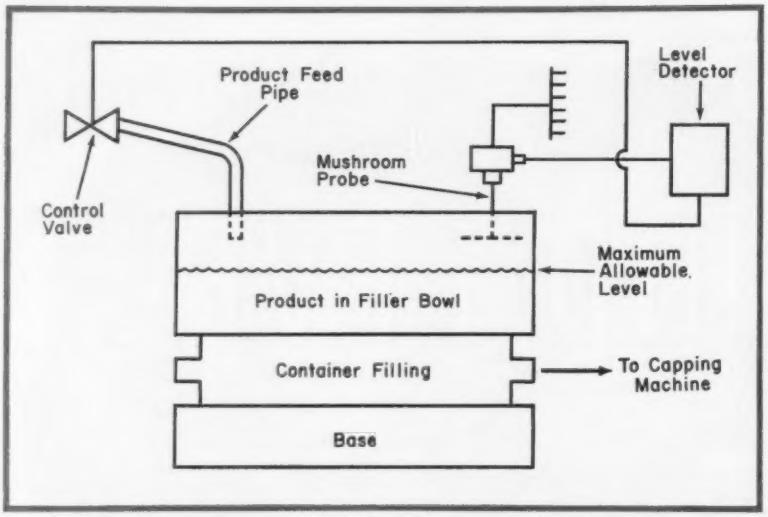


FIG. 1. SANITARY FILLER BOWL level detector-controller uses high-level probe that acts as a capacitor.

mote panel controlling the process.

Measurements are made with electrodes or probes (bare or insulated) that may or may not contact the product. Sensor outputs (electrical, pneumatic, or electrical-pneumatic signals) are transmitted to indicators (if records aren't important), to recorders (if record is desired), or to controllers (for automatic level control).

Control systems use "on-off" type instrumentation for local or remote tank-level indication, and to regulate product flow in or out of tanks. Some systems have master indicator and selector panels. First panel operates in conjunction with bulk-storage facilities, the second provides centralized control of tanks in processing areas.

Sensor signals can also be used with computers and data-handling equipment.

Special Applications

In filling pureed baby foods into glass jars, product piped into rotary filler hopper may overflow. It is not practical to use either a float-operated level detector or a product-contacting sensing probe.

Solution is a special high-level "mushroom-type" sanitary probe that operates as a capacitor above the hopper (421).

Control unit (Fig. 1) consists of a vacuum tube in a circuit operating as an inductance-capacitance bridge. A relay in the plate circuit is energized or de-energized according to amount of current in the circuit. Latter oscillates when a product with dielectric constant different than air approaches the probe and changes the circuit's capacitance. Relay is de-energized to stop product flow.

Another filler-control system not only prevents product overflow but keeps the bowl from running dry (422). It is simple, sanitary, and offers economical, trouble-free performance. Unit is applicable to hot-filled products, including those that are viscous or contain suspended solids.

System (Fig. 2) consists of temperature controller and sanitary control valve.

When product level is above horizontal bulb, product temperature is measured and its comparatively high temperature signals closing of control valve. When product level is below probe, instrument measures the lower air temperature, thus valve opens.

Similar level control is applied to hoppers feeding depositors with cake batters and confections.

Surge tanks supplying filters are controlled for more efficient performance. One system's panel board operates through air-actuated instruments to record level of incoming juice in tanks. An air signal proportional to tank level is transmitted to air-operated flow controllers. Control is by-passed when filtering at constant rate.

Levels of liquids fed into blending tanks or cooking kettles are also automatically gaged.

Significantly, level-gaging systems aren't always the best approach. Take, for example, the weight-selecting system recently installed in Borden's new Milwaukee dairy (FE July '60, p. 44).

Here, six digital-type dials are set for the respective weights of cream, liquid sugar, corn syrup, water, etc., in batching of ice cream mixes. Ingredients are delivered by manual or automatic control from holding tanks into a weigh-type batch tank with electronically-operated load cells (423).

Ranging the Types

► **Ball-float level sensor:** It is the most common tank gage used (424).

One type (Fig. 3) has a float that actuates a pointer through a

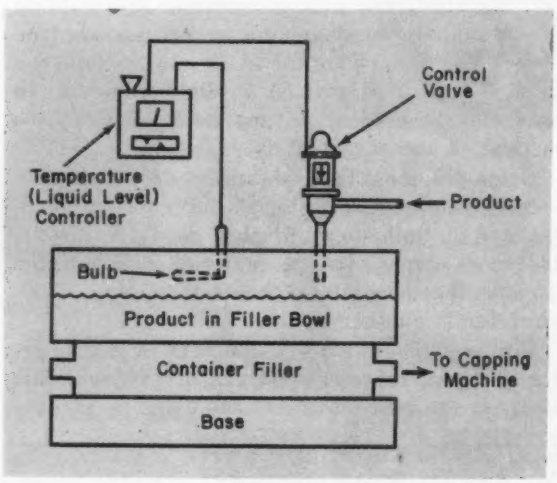


FIG. 2. HIGH-LEVEL probe infiller bowl senses product temperature, prevents overflow.

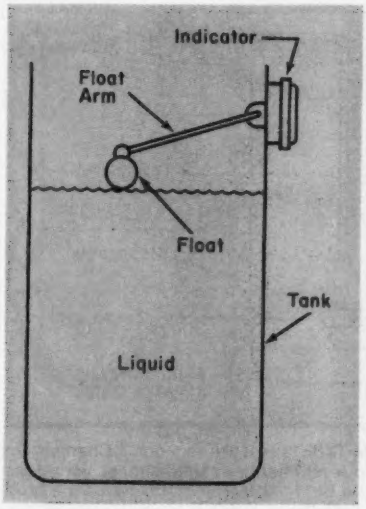


FIG. 3. BALL FLOAT SENSOR. Through mechanical linkage, float actuates pointer of indicator.

quadrant and pinion gear (not shown) at end of its arm. Another float mechanically drives a counterbalanced calibrated tape past a reference point.

When indicator is located away from tank, a pulley-potentiometer assembly is used (Fig. 4). Resistance changes vary current (or voltage) in a remote circuit. For control purposes, float-actuated switches or valves are used.

Although floats are simple, reliable, and low cost, they can't be used with solids-depositing liquids. Change in liquid specific gravity also introduces error.

► **Plate sensor:** Power-driven gage uses a solid-plate displacer instead of a friction-creating float, thus attains accuracy of 1/64 in., repeatability of 1/32 in.

Friction error is curbed by use of electric power to drive the indicating mechanism, remote indicating transmitter, and other accessories. Unit consists of a force-measuring mechanism (torque tube, arm, and contacts) and solid-plate displacer. Latter is suspended from torque arm by conventional perforated steel tape.

In operation, weight of displacer applies a known force to torque tube. When displacer is partially submerged in liquid, its pull on the torque arm is reduced. Since area of displacer is constant, variations in liquid level produce a proportional change in torque tube's force. Displacer is driven in and out of liquid by reversible two-phase servo-motor.

If load on torque tube is greater than net displacer load, motor drives displacer down to reduce the force by displacing more liquid. If force on torque tube is less than net displacement load, motor drives displacer up so less liquid is displaced and force is increased. By sensing net force produced by displacer, torque tube controls motor drive so balance is always restored, with displacer accurately positioned in relation to liquid level.

Net weight of tape decreases as liquid level increases, thus liquid line on displacer changes with liquid level. Varying net weight of tape is compensated by storage and sprocket sheaves so positioned that tape buildup on storage sheave shortens its effective length.

Where remote gaging is desired, gage can be equipped with a pulse code electronic transmitter for read-out. It can also be equipped with high- or low-level alarm

switches, a combination of both, or any automatic control accessory.

► **Buoyant-force-sensors:** They are used for control rather than continuous level sensing (425). A liquid-submerged probe (or displacer) is buoyed by a force equal to weight of liquid it displaces (Fig. 5).

Basically, the beam balance is the level controller. With beam balanced, difference between probe's weight and buoyant force times probe's lever arm equals sliding weight times its lever arm. A drop in liquid level reduces buoyant force, and probe rides down with liquid. System is rebalanced as sliding weight travels to increase length of lever.

An electrically-operated system employs bellows that serve as a pivot, with right end of the level arm spring-loaded to move quadrant gear. Latter drives the pinion gear and, in turn, the level indicator's pointer. Opening or closing of pointer-actuated electrical contacts provides signal that operates power relay, then a valve or pump in liquid line to maintain liquid level in tank.

► **Hydrostatic pressure sensors:** They measure pressure of liquid column directly above sensor (426). Height of this column above sensor is proportional to pressure.

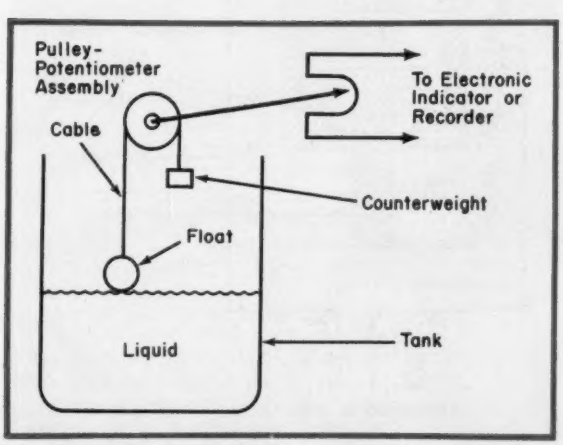


FIG. 4. REMOTE INDICATOR is hooked up to float sensor through pulley-potentiometer assembly.

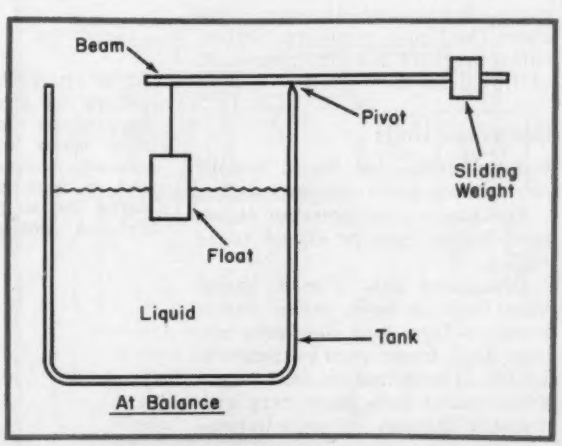


FIG. 5. BUOYANT FORCE SENSOR. Submerged body is buoyed by a force equal to that of displaced fluid.

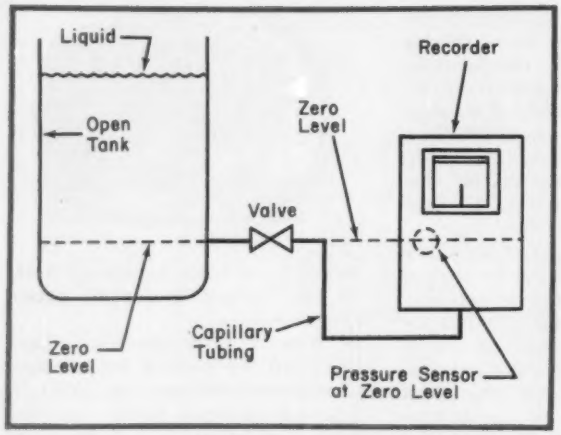


FIG. 6. DIRECT HYDROSTATIC pressure sensor comprises indicator or recorder, with Bourdon bellows sensor, connected to bottom of open tank.

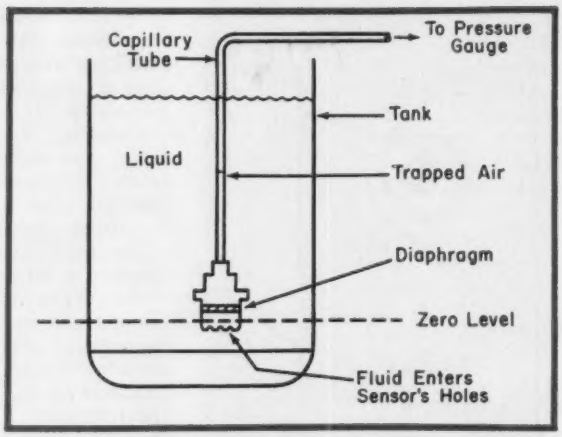


FIG. 7. DIAPHRAGM-TYPE pressure sensor. Changes in static pressure due to level changes cause similar variations in trapped-air pressure.

Basically, there are three types—

1. **Direct type** used with clean, noncorrosive liquids. An indicator (or recorder) containing a Bourdon bellows or a helix pressure-sensing element is directly connected to bottom of an open tank by capillary tubing (Fig. 6). Indicator is located at same level as tank, and range of liquid measured depends upon type of pressure-sensing element in system.

2. **Diaphragm sensors** have pressure element mounted inside tank, and are vented (Fig. 7). Sealed system comprising diaphragm, capillary tube, and recorder of Bourdon tube (or other pressure sensitive element) traps air. Variations in static pressure produced by level changes cause corresponding variations in trapped air's pressure.

3. **Differential gages** measure liquid level in sealed tanks, with pressures above or below atmospheric. Bottom-of-tank hookup gages hydrostatic pressure plus above-the-liquid pressure. Differential pressure is a direct measure of liquid level.

Electronic Units

► **Load cells**—for liquid weight or indirect level measurement:

The strain-gage pressure sensor operates in open or closed tanks (427).

Illustrated unit (Fig. 8) measures level in open tanks. Static pressure from tank displaces bellows that move gage's armature. Latter is attached to four strain gages whose resistances vary with pressure changes. Increase in pressure stretches two of the strain-sensitive resistors and compresses the other two, and vice versa.

Each resistor acts as an arm in a resistance bridge, whose output is applied to a millivoltmeter or electronic potentiometer.

► **Thermistor level sensor:** This simple level switch (Fig. 9) uses a thermistor—a thermally sensitive resistor whose resistance decreases with increasing temperature (428).

Unit is sufficiently energized to keep its temperature well above that of its surroundings. When covered by liquid, it loses heat. The resulting drop in temperature causes a large increase in thermistor resistance, followed by a current drop. Relay then opens so that liquid is no longer pumped into tank.

Level switches using this principle incorporate the thermistor as a leg of resistance bridge to provide control less dependent on voltage variation.

► **Electrical conductivity sensor:** If liquid resistivity is below 20,000 ohm-cm., sufficient current passes to operate a sensitive relay. With an amplifier-relay combination, liquids of far greater resistivity can be measured and controlled (429).

High-low level warning system (Fig. 10) is a series circuit con-

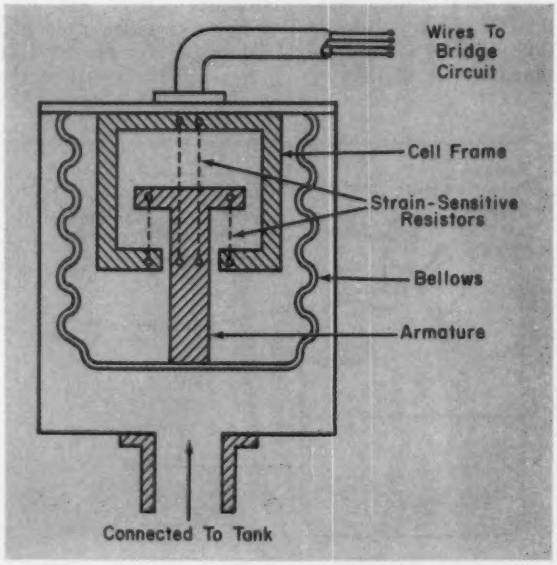


FIG. 8. LOAD CELL features four strain gages whose resistance varies with pressure changes. Unit is used primarily for weighing tank contents.

For more information, circle key numbers on Reader Service Card, back of book

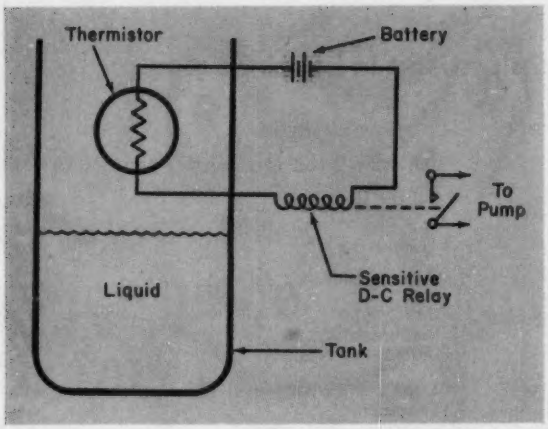


FIG. 9. THERMISTOR works on the principle that an increase in a semiconductor's resistance (through temperature changes) decreases current flow.

sisting of low voltage source, warning lights, bare electrodes, liquid tank. When liquid touches high-level electrode, current flows through control or warning circuit. Relays enable control functions such as operation of valves and pumps.

Both electrodes are connected to relay to provide an electrical lock-in action. Relay is not energized until liquid contacts upper electrode. Then, having been energized, relay isn't de-energized until liquid level drops below lower electrode.

► **Capacitance - type sensor:** Dielectric properties of a liquid enable highly accurate level gaging (430). Capacitance instrumentation offers accuracy previously associated only with lab-type equipment. And it accommodates variables convertible to extremely small changes in capacitance—ability of a capacitor to store an electrical charge.

A capacitor is a pair of conductors (or plates), separated by a non-conducting material (the liquid) called a dielectric. Capacitance changes in an electrical circuit reflect variations in liquid level.

Typical installation (Fig. 11) consists of measuring element and instrument. The sensing probe insulated from tank forms one plate of a capacitor. The tank itself represents the other, or grounded plate. Space between both comprises the dielectric (either air or liquid).

A modification for liquid "insulators" (like oils) consists of a capacitance probe with two concentric cylinders or parallel plates spaced by insulators. As liquid rises, air (unity dielectric constant) is replaced by liquid (higher dielectric), which increase capacitance.

Calibrated in units of level, instrument measures capacitance changes and actuates a pen or recorder.

Through coaxial cable, capacitor is adjustable for oscillation when liquid level is below probe. When level rises to probe, capacitance changes sufficiently to "kill" oscillator. This energizes a relay providing on-off action to alarms, control valves, etc. Capacitance measurement usually is accomplished by an induction-capacitance bridge, with meter (in bridge) calibrated in units applicable to size of tank.

► **Surface sensor:** Gage completes an electric circuit the instant a descending bob contacts the liquid surface (431).

Bob normally rests at top of tank, and descends to surface. Tape holding bob is connected to a mechanical counter that is calibrated in feet and inches.

Another surface sensor consists of a hollow metal cylinder from which a straight wire radio-frequency radiating antenna penetrates the liquid surface 1/16-in. (432).

Servo system maintains antenna tip at this depth as liquid level rises and falls. A continual "up" signal (fixed bias) is applied to sensor's drive motor. When sensor is not near surface, gage generates a "down" signal to override bias. As sensor drops, probe tip penetrates surface, detunes oscillator, and energy loss reduces antenna signal level until fixed bias equals antenna level when drive motor stops. As level rises, antenna signal drops so that "up" signal takes over, raises probe until antenna and bias signal are again equal.

Radioisotope and Sonar

► **Radiation sensors:** They use gamma rays emitted from a radioactive source such as cesium-137, cobalt-60, or radium (433).

Basis of measurement is absorption of radiation by the liquid. Source is either internally or externally mounted to tank, and used in conjunction with a detector (Geiger, scintillation counter, or ionization chamber).

One installation (Fig. 12) con-

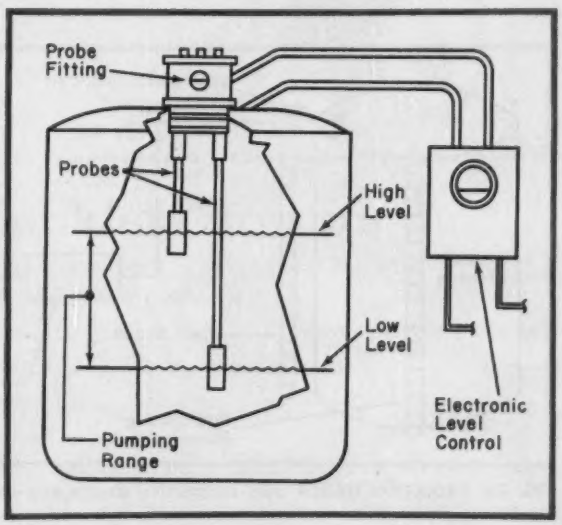


FIG. 10. ELECTRICAL CONDUCTIVITY SENSOR employs liquid as conductor and high-low level electrodes.

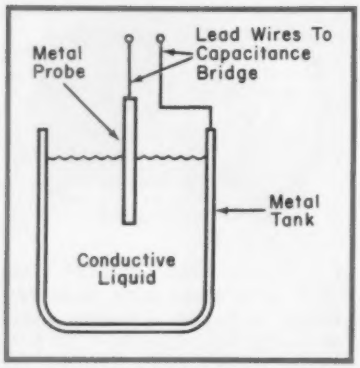


FIG. 11. CAPACITANCE-TYPE SENSOR with metal probe and tank as plates, uses dielectric difference between air and liquid.

Principles Used in Level Gaging

SENSOR TYPE	MECHANISM
Float	Ball float linked to indicator Ball float that drives calibrated tape past reference point Ball float with pulley-potentiometer assembly
Buoyant force	Liquid-submerged probe
Hydrostatic pressure	Direct type Diaphragm type Differential type
Electronic	Load cell—weight-level Thermistor Electrical conductivity Capacitance Photocell
Surface	Descending probe Descending R-F radiating antenna
Radiation	Stack of radioactive sources Single or multiple radioactive sources Float-riding radioactive source
Sonor	Pulsed sonic vibrations

sists of a stack of radioactive sources mounted outside of tank and detector mounted across a chord. Detector's output passes through a preamplifier to a highly sensitive electrometer calibrated in level units. As level increases, measuring cells' positively generated current decreases as negative current from compensating cell remains unchanged.

Another installation employs thermowell-enclosed radioactive sources. Intensity of radiation, which varies inversely with level, is measured by Geiger counter. Latter's output is amplified and applied to a potentiometer that records level.

Another method employs a float that carries a radioactive source as it rides between vertical guides. Significant feature is absence of electrical connections to within-the-tank source.

These gages can be hooked up to electronic controls. A relay can be energized to complete the circuit to a pump that maintains liquid level at desired point.

► **Sonar gages:** Pulsed sonic vibrations are transducer-transmitted from tank's bottom to its surface, where they are reflected to a receiver for conversion into electric pulses (434). Time between pulse transmission and echo is a measure of liquid level.

Gaging of Solids

Solids-level detectors are of two general types—continuous and fixed point. Accuracy with which the surface of solids in a bin can be located is limited because particles form a cone-shaped pile that varies in average density.

. . . **Continuous indication** is provided by various systems used for liquid-level detection, such as nuclear, sonic, and capacitance-type detectors. Beam scales and other weighing devices may also be used, particularly on small tanks.

Surface of a stream of finely divided particles may be gaged continuously by use of a grid-type element supported and weighed by a conventional pneumatic system. Weight of the element increases with its immersion.

. . . **Fixed-point indicators** signal that solids in a bin have reached a particular point.

Common types include diaphragm-operated units, pendant probes, and paddlewheels. Latter rotate continuously above the solid surface until stopped by the resistance of the rising material.

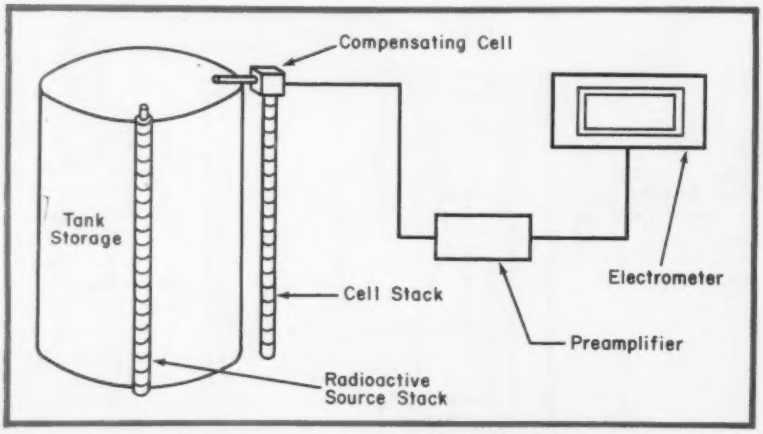


FIG. 12. RADIATION GAGER uses radioactive source and gamma-ray detector for measuring liquid level.

Acknowledgments: The following companies made major contributions to this article: Baldwin-Lima-Hamilton Corp., Waltham, Mass.; The Bin-Dicator Co., Detroit, Mich.; The Foxboro Co., Foxboro, Mass.; King Engineering Co., Ann Arbor, Mich.; Industrial Nucleonics Corp., Columbus, O.; Instruments, Inc., Tulsa, Okla.; Liquidometer Corp.; Long Island City, N. Y.; Ohmart Corp., Cincinnati O.; Radiation Counter Labs., Skokie, Ill.; Ramsey Engineering Co., St. Paul, Minn.; Robertshaw-Fulton Controls Co., Anaheim, Calif.; and The Vapor Recovery Systems Co., Compton, Calif.

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In fat-based foods *Myverol® Distilled Monoglycerides* **are widely recognized for one group of effects. In shortening, for example, they so control the tricky relationship between batter "curdle," bubble size, and cell-wall strength that a wonderful cake texture comes out of the oven. They permit peanut butter to go to the beach on a July day without leaking oil, yet spread smoothly after a week in the refrigerator.**

In starch-based foods *Myverol Distilled Monoglycerides* **have won just as big a place for an entirely different effect—the complexing of dissolved amylose. Dehydrated potato products have enjoyed their rip-roaring success because they make up into a food that looks like, tastes like, and *is* mashed potato, not library paste. Hot cereals no longer need inevitably turn jellylike a certain time after cooking.**

A very small content of these unique molecularly distilled monoglycerides profoundly affects the delicate architecture of foods. Prepared from the glycerolysis of edible fats or oils, *Myverol Distilled Monoglycerides* are exempt from the Food Additives Amendment. For technical data and prices write ***Distillation Products Industries,*** Rochester 3, N. Y. Sales offices: New York and Chicago • W. M. Gillies, Inc., West Coast • Charles Albert Smith Limited, Montreal and Toronto.

distillers of monoglycerides made from natural fats and oils

DPi

Also . . . vitamin A in bulk for foods and pharmaceuticals

Distillation Products Industries *is a division of* **Eastman Kodak Company**

Marketing Signals

How to cut paper costs . . .

Industrial marriage probed

. . . Lush look overseas

Poultry Boom May Chicken Out

That cloud on the poultry processor's horizon, no larger than a pin feather, is the awesome prospect of a declining export market. In the past 6 yrs., poultry exports to the Common Market have skyrocketed from $100,000 to an estimated $25 million.

However, USDA's Foreign Agricultural Service warns that by 1967, when the 6 CM nations are scheduled to have raised tariff barriers against imports from the outside, US poultry will face 3 big obstacles. To wit: 18% tariff, additional fees to cover differences in feed grain prices (usually higher in CM countries), and "gate price" devices (which sets minimum prices for imported goods).

Chains Just Keep On Trying

Latest wrinkle in manufacturer-retailer relations is the chains' attempt to "integrate" their paperwork backwards. Food firms report being asked to prepare certain forms (such as bill of lading) with extra carbons to pass on to retailer, who is thus spared the necessary clerical work.

Strong Vote For New Products

Candy makers will push new items to lift sales in '61, according to National Confectioners Assn.'s annual roundup. Some 87% of respondents plan to unveil new products this year. And 26% feel that new items will be the principal economic force behind bigger candy sales ("growing population" led the list with 31%). All told, 68% look for higher sales, 36% for profit improvement.

Canned Soft Drinks Taking Hold

Despite spotty distribution and lack of big-brand promotion, canned pop was bought by 25% of US families last summer, reports Jones & Laughlin. Earlier American Can survey placed usage level at 18% in '57. Results of the two polls show family usage of deposit bottles dipping from 92% to 91%, no-deposits from 18% to 16%.

Trends In Merger Suits Studied

A National Industrial Conference Board analysis of anti-merger suits by the Government shows that 25% of the legal cases concerned food companies. NICB notes that "contrary to popular impression, enforcement has focused, not on size of acquiring or acquired company, but on market effects."

Mergers are more likely to lead to government action, NICB observes, if purchasing firm's sales and assets exceed $10 million, acquired unit is one of major outfits in its field, and if high percentages of output of products or services in question are concentrated in relatively few companies.

Coin-Feeding Triggers Vending Growth

Feeding of plant and office personnel through automatic full course, hot meal equipment will spark vending industry growth this year, predicts Pres. Harold Roth, Continental Industries. He says that over 96% of all present major manufacturing facilities are potential markets for full line in-plant feeding. **Food vending sales the next few years, he adds, should top sales of all other vended products.**

Coupon Ruckus Settles Down

GMA and Los Angeles distributors moved closer to agreeing on what can be done to make coupons more palatable to retailers. Two groups endorsed these recommendations:

1) Coupons be perforated for easy removal. 2) Two standard sizes be used—dollar bill and punch card. 3) "Store coupons" be distinguished from "mail-in certificates."

To answer retailers' chief objection, GMA will finance a study of store operators' coupon handling costs. Results should be out in about 5 mos.

Overseas, Grass Is Greener and Greener

Here are 2 recent items which indicate why more American food-beverage firms get that heady feeling when turning to overseas markets:

First, *Newsweek's* capital expenditures survey (carried out by NICB) shows that **capital spending by food-beverage firms for foreign operations soared 409% above year-ago levels in the 3rd quarter of '60.** This compared with a 106% rise for all-manufacturing, and lifted food expenditures to $7.9 million.

Second, Ralston Purina's overseas sales should climb from $30 million in fiscal '60 (ended last Sept.) to $50 million in '61, according to stock broker Merrill Lynch, Pierce, Fenner & Smith.

BRIEFS

One-third of refrigerated warehouses plan space expansion, reports Chilton's "Distribution Age."

Average retailer stocks 9 beer brands, says Lone Star Brewing.

New products not limited to bigs: Arnold Bakers last year introduced 22 new items and packages.

Do You Know the Answers

1 What can you do if a purchaser denies a valid contract?

2 Taxwise, are you a merchant or a manufacturer?

3 Can you use your "lawyer's advice" as a successful defense?

4 Is the government liable for storage charges on seized goods?

5 Who pays the sales tax on advertising display materials?

If not, you should—they're problems you might face. Here are recent food-related decisions that help povide the answers

THE LAW AND YOU may not always see eye-to-eye on a particular ruling—so it's best to know beforehand what your legal responsibilities are or are not.

While precedent can be broken, it's highly unlikely. Consequently, acquainting yourself with previous decisions affecting the food and beverage industry will provide you with a valuable guidepost in estimating your chances for success if faced with litigation.

To help you familiarize yourself with some precedents, we have briefed 10 case histories that may help you through tough legal situations.

Court index references are cited for those wishing to make library checks for complete information regarding a particular decision.

1. Must Prove Purchase

An official of a large canning corporation asked these legal questions: "If a purchaser of canned goods denies that he made a valid contract to purchase canned goods, what must the seller do to win a suit? What can the seller do to get rid of the canned goods the purchaser refused to accept?"

The canning company should sell the goods at the highest obtainable price and then sue the purchaser for the difference between the price he obtained and the contract price, plus expenses and interest.

For example, in Brownsburg Canning Co. v. Central Retailer-Owned Grocers (147 N. E., 2d, 437)—A food broker negotiated the sale of 7,500 cases of tomatoes by Brownsburg to Central, a purchaser of canned goods for retail grocers.

After receipt of this order the canning company received from the purchaser 60,000 labels which were affixed to cans. He then awaited shipping instructions which the broker promised would be promptly forthcoming. Two months later the broker wrote the purchaser that the cans had been labeled and requested shipping instructions, but received no answer. After two more months, a canning official informed Central that they wanted to ship the tomatoes as soon as possible and that the price of canned tomatoes had fallen. Three months after this, the purchaser issued shipping instructions for 1,000 cases and again later for 600 cases.

The price of tomatoes continued to decline and, not receiving further shipping instructions, the canning company sold the tomatoes on hand for the best price available. A suit was then filed by the canning company against the purchaser to recover $5,083.91, the difference between the price specified in the original contract and the low price at which the canning company was compelled to sell the tomatoes, plus incidental expenses of removing labels from the cans, warehouse storage expenses, interest, etc.

Central defended the suit on the contention that no valid contract existed between it and the Brownsburg Canning Co.

But the higher court held the purchaser liable in $5,083.91 damages, saying: "In January, Central orally confirmed the purchase and in May and June of that year it gave shipping instructions for portions of the goods ordered, thus confirming the order as a subsisting contract."

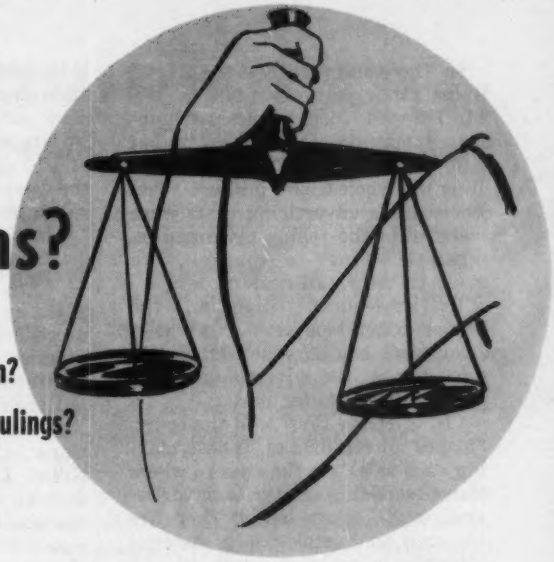
2. Need Definitions

Often the validity of taxes paid to a state depends on whether the taxpayer is a manufacturer or merchant.

A higher court has held that the distinction between a manufacturer and a merchant is that the merchant sells to earn a profit, and the manufacturer sells to take profit already earned. In other words, the manufacturer must buy the materials out of which to make his

LEO T. PARKER
Attorney at Law, Cincinnati

to These Legal Questions?



6 If attorney fees are unspecified, must you still pay them?

7 What are your chances of appealing "adulterated" food rulings?

8 Can a jury compromise a suit for damaged goods?

9 Must a non-profit marketing association pay taxes?

10 Who is liable for in-transit damage to food products?

finished product, and he must sell the product of his factory after it is finished.

The case was Smith v. Tax Commissioner (165 N. E., 2d, 638) and testimony showed these interesting facts: A company receives beans in large quantities and ultimately packages and reships the beans for retail sale. In the course of operation, foreign substances were removed by a vibration and forced air, and ferrous metals are taken out via electromagnets.

After considerable controversy, the state's Tax Commissioner held the company to be a merchant and not entitled to a low tax rate provided by the state's laws relating to manufacturers. Decision reversed by the Board of Tax appeals.

But the higher court upheld the Commission's decision, saying: "We have admitted that what constitutes manufacturing can only be determined with difficulty. The taxpayer contends that it is a manufacturer because the beans as it receives them are not saleable under federal law but become so after treatment. But it is our conclusion that the Board of Tax Appeals did not properly apply the tests and its decision is therefore unreasonable and unlawful."

3. Test 'Lawyers Advice'

A shipper of food products may avoid penalties for exceeding his allotment as stated under the Agricultural Marketing Agreement Act, by proving that he relied upon advice of his lawyer who had based his advice upon prior unreversed higher court decisions.

Case in point—U. S. v. Lo Bue Bros. (274 Fed. Rep., 2d, 160).

Testimony showed that the shipper had relied on advice of attorney that, under designated section of the law, he could make excess shipments without penalty after he had filed a petition with the Secretary of Agriculture.

Since such advice was in accord with the only court decisions construing the law, the higher court held that the shipper did not willfully exceed his allotment. The Court said: "Although the appellees (company) were eager to ship their fruit in order to avoid substantial financial loss, it is clear that they did not ship one orange in excess of their allowance until they had received the assurance of a reputable attorney that they could ship under the immunity which he informed them was provided. His advice was based on the only court decisions which had construed this law and was in accord with these decisions."

4. U. S. Not Liable Here

Is the U. S. liable for storage charges on seized merchandise which it stored in a warehouse?

According to a leading higher court decision the government is not liable for such payment.

In United States v. Smith Canning Co. (249 Fed. Rep., 2d, 382) —testimony showed that the U. S. government seized several carloads of tomato paste believed to be adulterated. The paste was stored by the government's agent in a warehouse while awaiting court disposition. During a later trial it was determined that actually the paste was not adulterated. Hence, the manufacturer could take the paste from the warehouse and sell it through regular channels.

In subsequent litigation, it was contended by the warehouseman that the government must pay $2,-268.09 for service charges of unloading the railroad cars and moving the cartons to the warehouse. It was contended that the government is liable because the charges grew out of the negligence and wrongful act of an employee of the government.

A lower court held that the government must pay the charges, and stated the manufacturer need not pay the warehouseman. But the higher Federal Court reversed this decision holding that "the lower court was entirely without authority to assess damages against the United States."

5. Problem in Sales Taxes

Considerable discussion has arisen over whether a food manufacturer or distributor is lawfully required to pay the state sales tax on advertising materials furnished to retailers.

According to a higher court decision, the answer is "No."

(Turn page)

In the pertinent case — H. J. Heinz Co. v. Bowers (165 N. W., 2d, 792)—a food wholesaler purchased material for display by retail grocery establishments handling the wholesaler's products. The wholesaler's advertising costs were included in the selling price and no separate billings or charges were made to the retail dealers.

In subsequent litigation, the higher court held that the wholesaler need not pay the state's 3% sales tax on the advertising material but the retailer must.

"H. J. Heinz Co.," said the court, "makes no retail sales. Those making such sales are the ones to whom the advertising material is delivered, and, consequently, they are the ones who employ such material 'directly in making retail sales.'"

6. Attorney Fee Payment

A higher court has held that if an insurance policy does not clearly provide that the insurance company must pay the cost of attorney fees expended by the holder of a policy, the insurance company is not required to pay such expenses incurred by the insured. For instance, in Bybee v. Fireman's Fund Insurance Co. (331 S. W., 2d, 910), it was shown that an insurance company issued a policy which insured Bybee against hail damage to a peach crop. The insurance company refused to pay the damages claiming that the policy did not cover Bybee.

The higher court rendered its judgment and then Bybee sued the insurance company to recover the expenses of the suit, including his attorney fees. Court refused to render a decision in favor of Bybee, stating that there "is no statutory basis for a recovery of such items."

7. Higher Court Agrees

Generally speaking, a higher court will approve a lower court's conviction of a person or corporation for shipping adulterated food products in interstate commerce, unless evidence is contradictory.

Take Egg Products Co. v. United States (260 Fed., 2d, 469). The company was convicted in the U. S. District Court for unlawfully introducing into interstate commerce a number of cans containing frozen whole eggs which were adulterated.

Egg Products appealed to the higher court on the contention that the government agents did not prove conclusively that the eggs were adulterated.

Higher Court's conclusion: "Whether the eggs were adulterated within the meaning of the statute was a factual issue. We are of the opinion that the finding of the District Judge is supported by substantial, competent evidence."

8. All or Nothing

It has also been decided by precedent that a jury cannot compromise a damage suit or average allowable damages.

Here's a pertinent food-case — National v. Great Lakes Warehouse Corp. (261 Fed. Rep., 2d, 35). Great Lakes operated a general storage warehouse as a public warehouseman. It issued its warehouse receipts to the Milwaukee Cheese Company for 480 cases of Kool-Aid stored in its warehouse and owned by the latter. Following a disastrous fire, the Milwaukee Cheese Co. submitted a proof of loss to the National Fire Insurance Co. for $8,805.89, the value of 480 cases. The insurance company paid the full amount of the loss to the cheese company, and received $2,-299.92 in salvage from the sale of damaged Kool-Aid, making its net loss $6,505.97. Then the insurance company filed suit against Great Lakes to recover the net loss.

The jury decided that the fire loss resulted from the negligence of Great Lakes. Instead of holding the warehouse company liable to the insurance company for the full amount ($6,505.97), the jury allowed the insurance company only $3,252.49 or one-half. Later testimony disclosed that certain members of the jury decided that the fire loss had resulted from negligence of employees of Great Lakes, but other members of the jury believed otherwise.

The higher court reversed the jury's decision, pointing out that "one-half the amount cannot be said to be a mere coincidence. If there was liability on the part of defendant, the insurance company was entitled to recover the amount of insurance it paid to its insured after giving credit for the fair cash market value of any part of the Kool-Aid that was salvaged after the fire. It is absurd to say this is anything other than a compromise verdict and highly improper."

9. Business Definition

Discussion also arises over the question of "What is business?" Precedent says the term includes all activities engaged in with the object of gain, benefit, or advantage to the taxpayer or to another person or class, directly or indirectly.

In Sumner Rhubarb Growers' Assn. (350 Pac., 2d, 478) the court showed that even a nonprofit, cooperative marketing association is a "business" and must pay taxes. The association markets the rhubarb grown by its members. Growers package the rhubarb in boxes and the association labels the boxes for grade, advertises the rhubarb, and sells it at wholesale. Growers receive payment according to the market price less expenses.

In subsequent litigation, the higher court held that the association is a "person" engaged in business, subject to the operation of the state's business and occupation tax, and "it is immaterial whether Sumner Rhubarb is an agent of the farmer."

10. Carrier Held Liable

Damage to food products in transit raises the questions of liability. Is it the common carrier or the manufacturer?

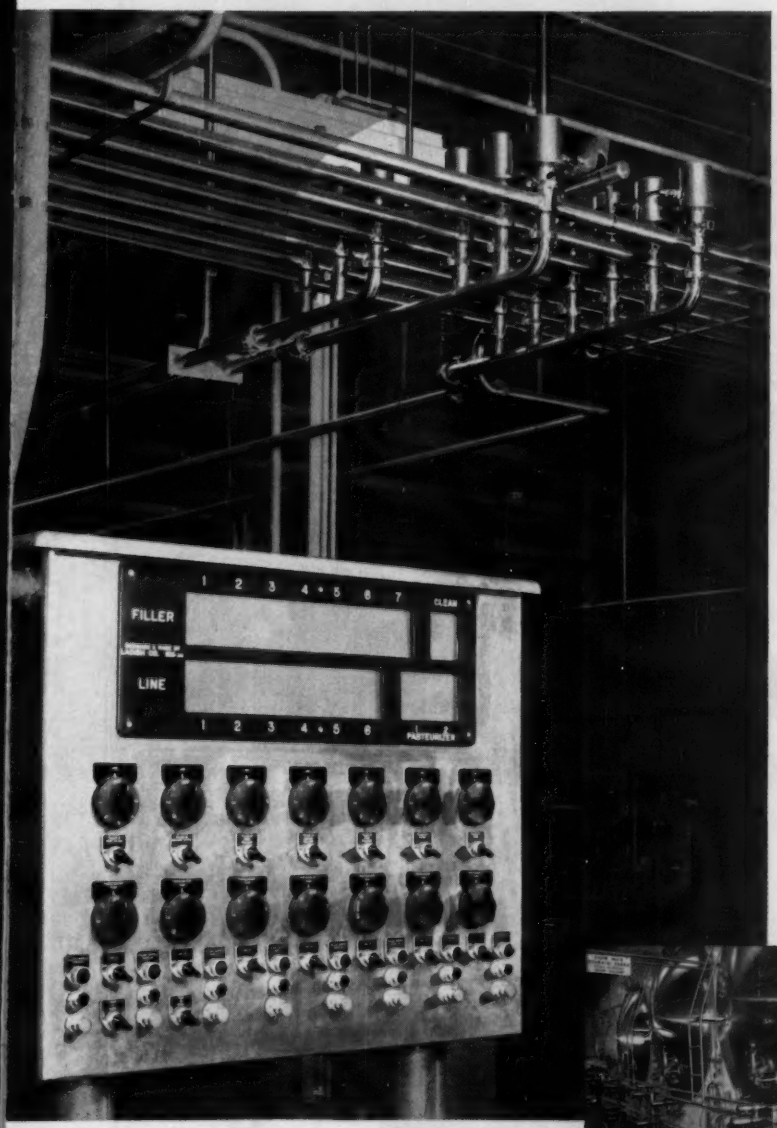
In Columbus Co. v. Shore (276 Fed. Rep., 2d, 93) it was shown that the agent of a common carrier receipted for a shipment of bananas in apparent good order. There was no testimony that they were in any condition other than fit for shipment. But when discharge commenced, the bananas were found to be ripe, heated and cooked.

Testimony showed that the carrier's generator, which was the source of power for the main compressor, was disabled because of a worn armature. This condition could have been detected for some time prior to the breakdown by means of "mega readings" and there was testimony that this condition had existed over a period of time and could not have happened suddenly without warning.

The higher court held the carrier liable for $6,367.27, the difference between the value of the bananas when accepted by the carrier for transportation and their value when ready for delivery to the consignor. Court pointed out that "the receipt of the cargo of bananas in good order and condition raises a prima facie case as to the condition of the cargo at time of shipment. The carrier has produced no evidence in rebuttal. Evidence establishing refrigeration failure rules against the carrier." (End)

TRI-CLOVER EQUIPMENT

sets new standards in automatic processing at new Borden plant



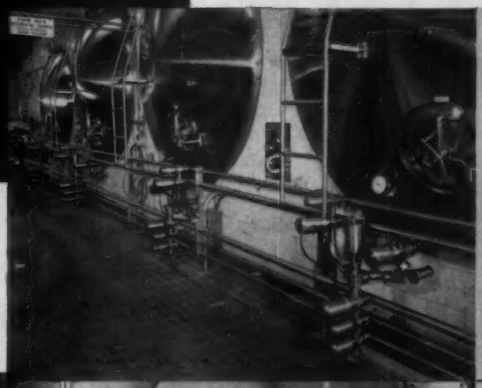
Control center above automatically controls the flow of milk to fillers. Panel has a projection type digital display unit which shows at a glance exact status of filling operation.

Ladish Co. is proud of the important part played by its Tri-Clover and Fesco Divisions in helping The Borden Co. achieve new standards of efficiency in the modern, automatic processing operations of their new "*Dairyland Showcase*" plant in Milwaukee, Wisconsin.

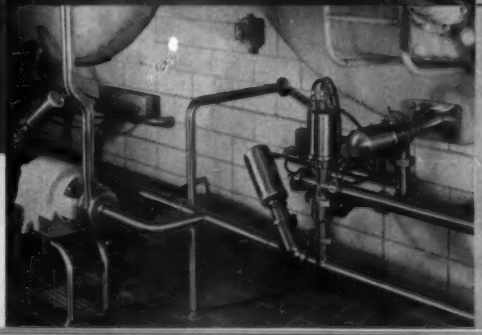
Designed, manufactured and installed by Ladish Co., Tri-Clover and Fesco Divisions, equipment to process up to 500,000 quarts of milk per day includes 152 "FESCO" air-actuated valves . . . modern control panels . . . hundreds of "Tri-Weld" stainless steel welding fittings, welded in place with a "Tri-Welder" automatic welding machine right in the plant . . . numerous Tri-Clover sanitary centrifugal pumps . . . special pipe hangers and supports . . . as well as almost 7,000 feet of stainless steel tubing "Tri-Welded" on the job.

The combined engineering ability, design and manufacturing skill of these Ladish Co. Divisions has helped to lead the way to modern automated dairy plant operation. Let this wealth of experience serve you in your next expansion program.

Write for further information or see your nearest TRI-CLOVER DISTRIBUTOR.



Group of milk storage tanks having a combined capacity of 70,000 gallons, each of which utilizes seven "Fesco" valves for distribution and CIP operations.



Valve manifold for filling storage tanks and transferring milk from tanks to filling machines. Tri-Clover pumps are easily removed from lines for inspection and maintenance.

TRI-CLOVER

LADISH CO.
Tri-Clover Division
Kenosha Wisconsin

S161

IN CANADA: Brantford, Ontario
EXPORT DEPARTMENT: 8 South Michigan Avenue, Chicago Illinois
Cable TRICLO, CHICAGO, U.S.A.

TERRIFIC!

—and how long will the flexing member last?

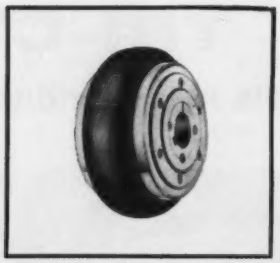
Good question. The heart of Para-flex is a tire with synthetic tension members bonded together in rubber—which provides a flexing body that automatically compensates for *all combinations* of misalignment and end float, and absorbs vibration as well!

This amazing coupling has now been used in American industry 4 years. Thousands are in operation—in steel mills, paper mills, oil fields, mines, quarries, chemical plants, everywhere—and in these 4 years, replacements of elements have been negligible.

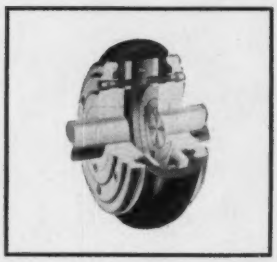
Dodge Para-flex takes angular misalignment up to 4°, parallel misalignment up to ⅛" and end float up to 5/16" depending upon the size of the coupling and the duration of shaft displacement.

Dodge Para-flex is available in 3 types—Standard, Flywheel and High Speed (shown at right). The Standard type is stocked in capacities up to 2000 hp at 1080 rpm. Ask your Dodge Distributor, or write us for complete technical bulletin.

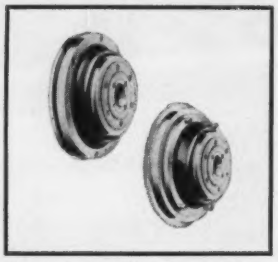
Dodge Manufacturing Corporation, 2800 Union Street, Mishawaka, Indiana



The new idea in flexible cushion couplings, with a flexing member that "swallows up" misalignment.



No lubrication, no maintenance. Replace flexing element without moving driver or driven machine.



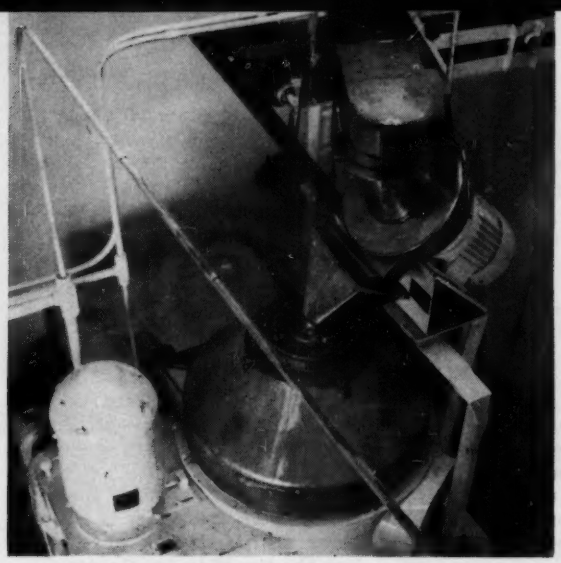
Flywheel and High Speed Types. For use with motors and internal combustion engines turning up to 5230 rpm.

The Products with the Pluses...

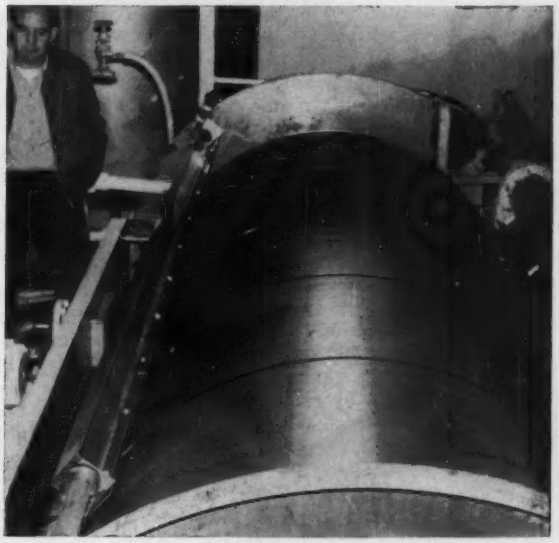
DODGE

of Mishawaka, Ind.

CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory trained by Dodge he can give you valuable assistance on new cost-saving methods.



◄ **DISINTEGRATOR** (upper right) crushes whole apples and centrifuge separates juice from pomace. These are key units in continuous extraction process.



▲ **VACUUM FILTER** has rotary screen which is precoated with 2 5/8 in. of filter aid. Screen is 10 ft. long, 5 ft. 3 in. in diameter.

◄ **FILTER AID** is mixed with juice from apple disintegrator and centrifuge prior to vacuum filtering. It is fed into tank through hopper with agitator.

New Juice Process Cuts Costs

Disintegrator teams up with centrifuge in continuous extraction to reduce labor to about one-third, make additive unnecessary.

"STARTING with the best" when it went into the production of apple juice, Sebastapol (Calif.) Cooperative Cannery installed a new $100,000 continuous extraction plant. And the process was selected only after many juice plants had been visited by Plant Manager Wm. Overstreet and his assistant Mel Davis.

FRANK K. LAWLER
Editor, "Food Engineering"

The new technique involves continuous disintegration of whole apples, centrifuging, and vacuum filtering at 1,000 gal. per hour. Heat stabilized, the juice needs no conditioner.

The process saves $75 a day by eliminating addition of pectin enzymes. Enough pectin is removed by a Mercone centrifuge to solve that problem in the heat-stabilized juice. So the juice can be 100% pure.

The process reduces labor cost to one-third. No manpower is required following the raw apple inspection belt, except for the foreman.

The conventional system requires four men, plus cleanup of a messy operation—including the washing of press cloths. Cleaning now is by easy in-place circulation of chlorine water and rinse water.

True, a little more juice is lost in this continuous process than in conventional methods. Occurring

in the centrifuge, the loss amounts to about 10 gal. per ton of apples.

Then, too, the prefiltered juice contains 7½% solids, and the cooperative would like to reduce this to 1½%.

But here is testimony to the quality of the juice: The cooperative has been unable to keep up with the demand. And it achieved this success with no advertising other than some point-of-sale promotion. What's more, buying continued as the price rose from $1.85 to $2.60 per doz.

How Juice is Produced

Apples brought in by farmers are dumped into a pond, or put into low-temperature (31-deg. F.) storage for use later. The plant is able to operate 100 days out of the year by using various varieties of apples and by refrigerated storage.

From the pond, apples pass underground by flume to an elevator conveyor and onto an inspection belt. Here two women take out culls which are sold to a Lodi winery for $8 per ton.

Inspected fruit travels up via elevator conveyor to a Reitz disintegrator with a 3/16-in. screen. The 15-hp. disintegrator normally handles 7 tons per hour, has top capacity of 12 tons. The disintegrator feeds the comminuted apples into a 30-hp. Mercone centrifuge.

Pomace from the centrifuge goes into a Food machinery screw press for final extraction, then is discharged to waste. The juice from the centrifuge is moved by a positive-displacement, sanitary Waukeshaw pump to a mixing tank, while screw press juice goes through the centrifuge again.

In the mixing tank, filter aid (diatomaceous earth) is added to the juice to the extent of 50 lb. per 1,000 gal. The filter aid is fed through a hopper equipped with an agitator, and it is mixed with the juice by an agitator at the bottom of the tank. Both agitators are driven by the same motor mounted on top of the tank.

Vacuum Filtration

Next unit in the process is a Dorr-Oliver vacuum filter. Before start-up, this filter is precoated with diatomaceous earth to a thickness of 2⅝ in. A trimming knife extending the length of the rotary filter screen maintains this thickness.

Juice is pumped into the tank base of the filter, and is maintained at constant level by photoelectric control. The fine-mesh stainless steel filter screen is partially immersed in the juice.

Vacuum is pulled inside the screen to draw the juice through the filter aid. The filter revolves at 1 rpm. and picks juice up uniformly over its entire surface. Ten feet long and 5 ft. 3 in. in diameter, the filter has a capacity of 1,000 gal. per hour.

Always looking to further progress, the cooperative is researching final separation of solids by centrifuge. Such a unit is used in separating pulp from juice in the citrus industry (see FE, April '60, p. 72).

At the end of the run, juice at the bottom of the filter tank is recirculated by centifugal pump and rubber hose back over filter to get all juice out of the unit.

Vacuum in the filter is pulled both at the top and the bottom to draw the juice effectively through the filter aid and minimize losses. And a mixer agitates the juice in the bottom of the filter.

To hold vacuum inside the filter, yet permit juice to flow out, the filter is equipped with a special valve. It has an oscillating disk with holes that match up with a stationary disk. When the holes line up, the juice flows out. When the holes are out of line, there is vacuum inside the filter. A vacuum of 25 in. is maintained in the filter with a 30-hp. Nash vacuum pump.

Precoating is applied to the filter with the aid of two small Ingersoll-Rand positive-displacement vacuum pumps. Quite a volume of air must be removed and handled by the pumps. And it takes about 2 hr., normally, to build the pre-coat to a thickness of 2⅝ in.

Consumption of filter aid amounts to 750 lb. in 8 hr., and two admix tanks can be used to feed it and the juice.

Pasteurizing, Filling

From the filter, juice discharges into a separating tank, on which the filter vacuum is pulled. Inside this tank the juice is separated from air by a series of baffles.

Air passes upward through the vacuum line, while juice flows downward into a centrifugal pump, goes through a small Klein 65 sq. ft. polish filter and then passes through a plate heat exchanger. Juice in maintained inside the separating tank at a level of 14 to 15 in.

The plate heat exchanger brings the temperature of the juice to 185 deg. F., and the temperature is accurately controlled by a bypass recirculating valve of the type used on dairy pasteurizers. This valve is precisely actuated by a Taylor pneumatic controller with anticipating action.

In the heat exchanger hot water flows on the side of the plates opposite the apple juice.

The pasteurized juice is filled hot into cans by a 12-pocket Pflaudler filler. And the cans are closed by a 400 American Can closer. Leaving this machine, the cans are inverted by a twist in the conveyor so that the hot juice sterilizes the top of the container.

The canned hot juice next flows through a water immersion cooler, being conveyed on a wire-mesh belt that is 6 ft. wide and 45 ft. long.

The cans come out of the cooler onto a rotating disk unscrambler which discharges the lithographed cans in single file onto a conveyor to feed the caser and bright-can operation.

The take-off conveyor has two lines, one for bright cans and one to feed the caser.

Bright cans are picked off the conveyor with a "pogo stick," 14 at a time. This stick is a two-handled aluminum bar with prongs spaced to catch under the top rim of the cans.

Two Million Cases

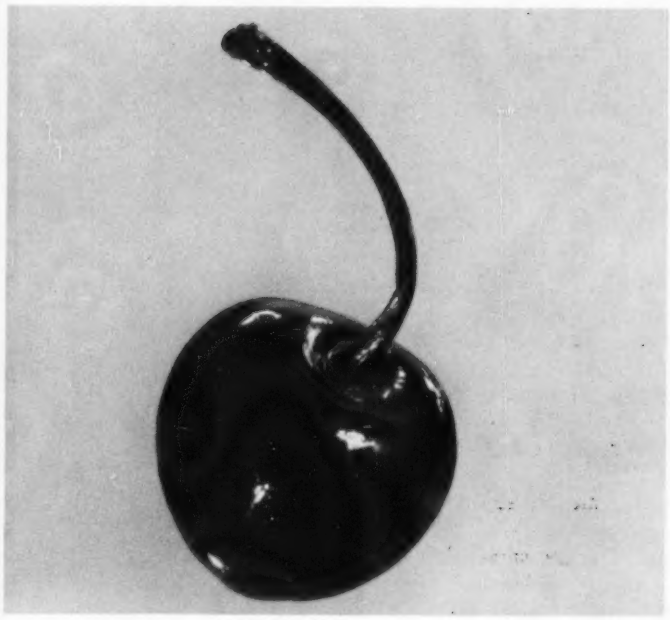
The Sebastapol cooperative has two plants, employs 1,000 people, and has 175 farmer members. It packs apple juice in 46-oz. and 29-oz. cans bearing the "Apple Time," "Apple Land" and "Apple City" brands. Starting in 1949, production was 167,000 cases. Now output is 2,000,000 cases.

The cooperative sells through many chain stores.

Most of its distribution is in the Los Angeles area. Some goes to Denver, Phoenix, Tucson, New Mexico and Nevada. It is also sold in the Northern California area.

(End)

FE Annual Editorial Index available upon request at 35¢ per copy.



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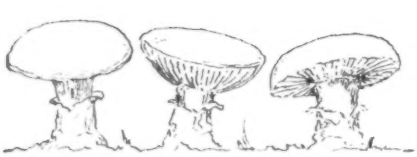

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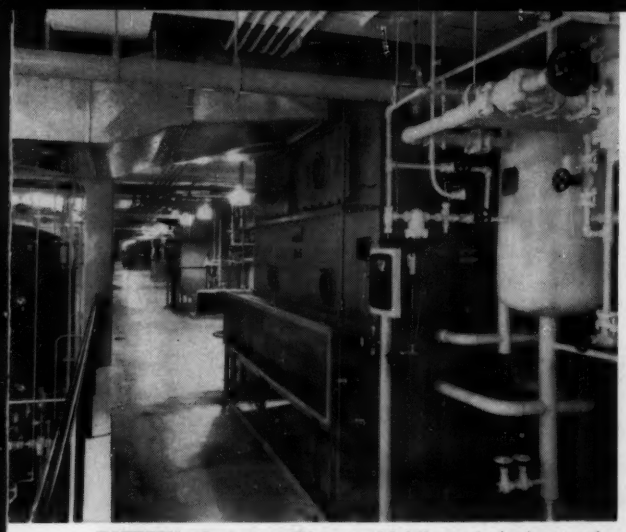
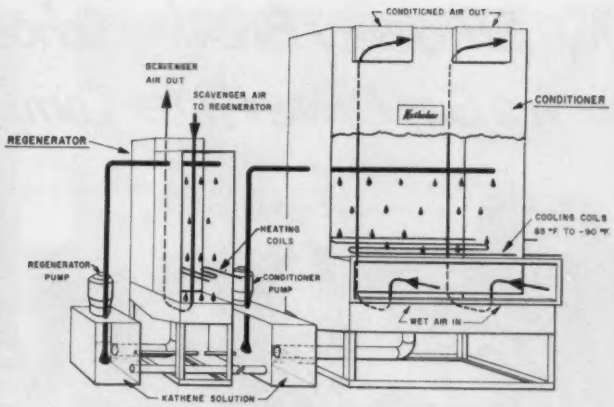
←CIRCLE 73 ON READER SERVICE CARD

CIRCLE 74 ON READER SERVICE CARD



BATTERY of air conditioners (right) controls brewery's air temperature, humidity, and purity. Dehumidification eliminates condensation of moisture in process areas, thus curbing possible mold growth.



SYSTEM SCHEMATIC: Moisture-laden air enters unit at lower right, then is drawn past cooling coils and through a flood of absorbent solution. Latter is regenerated (left) and returned to conditioners.

Air-Conditioning System Pays Triple Dividend

Efficient absorption-type dehumidifiers cut maintenance costs, boost quality control, and ease sanitation at Anheuser-Busch's Tampa brewery

A MODEL of advanced plant design. That's Anheuser-Busch's new brewery in Tampa, Fla.

Even the air inside the plant has been engineered—with a conditioning system that has already cut anticipated maintenance costs, improved quality control, and simplified sanitation.

Core of the advanced system is humidity-control equipment (Kathabar, Surface Combustion Div., Toledo, Ohio). It automatically controls the dew point below the temperatures of air circulated in process areas, thus eliminates condensation and possible mold growth, and quickly dries up spaces after periodic washdowns.

Simultaneously, the absorbent solution kills over 97% of all microorganisms in the contacted air stream. Temperature control and air distribution, in addition to control of air purity and humidity, are essential in brewing.

G. A. KELLEY
Chief Engineer, Kathabar Dehumidification Systems, Surface Combustion Div., Midland-Ross, Toledo, Ohio.

In mashing and wort-boiling, for example, product temperatures are all above ambient. After the wort is cooled and until the final beer is packaged, product in process is maintained at temperatures below atmospheric.

Cellar areas are kept at two basic temperatures—32F. and 45F., while automatic controls provide varying degrees of higher temperature. At 32F. the dewpoint is held at 17F., at 45F. it is held at 28F.

Fourteen dehumidifier units, capable of handling 150,000 cfm. of air, maintain specified temperatures and humidities in starting cellars and other areas—fermentation, lager, filter, finishing, and keg-racking.

With absorption dehumidifiers, there's no need to defrost coils or to control the subcooling and reheating of large quantites of circulating air. Their choice was also indicated by past brewery experience,, which showed that they could maintain low dew points under high humidity loads. Moreover, they proved reliable, simple, and inexpensive to maintain.

Keeping cellars clean and sanitary is the major maintenance objective at Anheuser-Busch. Procedure is to hose down all work spaces at least once each day with city water chilled to 60F. to reduce the heat load on process-cooling equipment.

Once a week, the entire brewery is brushed with stainless-steel scrubbers and washed down. A fine, diatomaceous-earth powder enables thorough scouring without scratching walls or equipment surfaces.

The only materials contacting product in process are: Copper in brew kettles, stainless steel in fermenters, glass lining in lager tanks, and rubber in transfer hoses.

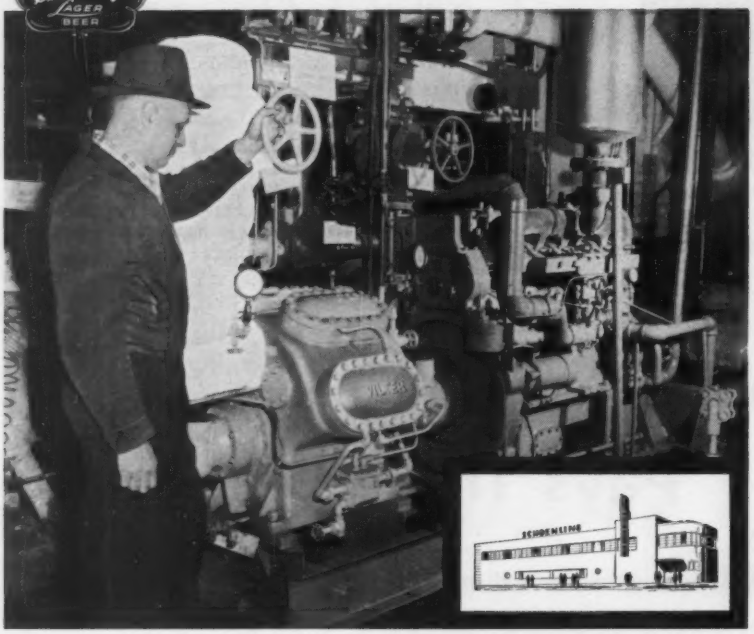
System in Action

The air-conditioning unit includes conditioner coils, regenerator coils, and a fan.

In operation, recirculated moisture-laden air enters lower part of conditioner unit and is drawn upward around finned cooling coils. It passes through a flood of lithium-chloride solution (Kathene), which

Top Efficiency Brewing Schoenling with a Gas Driven Vilter Compressor

The Schoenling Brewing Co., Cincinnati, has earned a reputation for fine beer with Schoenling Cincinnati's Finest.



Mr. Raymond Winterhalter, Chief Engineer, The Schoenling Brewing Co., inspecting the gas driven Vilter VMC ammonia compressor. Inset shows exterior view of the brewery.

To most efficiently meet summer brewery refrigeration requirements, the Schoenling Brewing Co. has added a Vilter 8-cylinder VMC ammonia compressor driven by a natural gas engine to its earlier purchased electric motor driven Vilter compressors.

By switching to the natural gas engine driven compressor during the summer months, when its gas requirement for heating purposes is reduced, Schoenling is able to utilize the major portion of the gas charged for, thereby reducing electric power demand and effecting considerable savings.

The natural gas engine driven compressor is especially ideal where capacity reduction is necessary to match widely fluctuating loads. Automatic speed regulation of the power unit can be supplied so that, together with the automatic capacity control available on Vilter VMC compressors, the most economical engine speed to suit the refrigeration requirements is automatically selected and maintained.

Schoenling is well pleased with the operation of the gas driven Vilter VMC compressor, and as a result of the reliability obtained, they have been able to reduce their cost of operation.

Almost 90 years of service to the brewing industry has given Vilter the necessary experience to produce the superior refrigeration equipment used with satisfaction in hundreds of breweries throughout the world. Let our qualified engineers help you with your problems.

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Write for Bulletin 017 to The Vilter Manufacturing Company, Dept. E-602 2217 South First Street Milwaukee 7, Wisconsin

absorbs moisture from the air.

Moisture absorption is controlled by varying the solution temperature, with a fixed solution density. The lower the solution temperature, the more moisture it absorbs. Because moisture is absorbed, frost does not form on dehumidifier coils even though refrigerant in the coils may be below freezing.

Cool, dry sanitized air discharges from the conditioning unit and is directed to cool areas in the brewery.

Absorbent solution, diluted with moisture from the air, is collected at bottom of unit. A small amount is pumped to the brewery boiler house for regeneration. Here solution is sprayed over heating coils to drive moisture out of solution. Vapor is picked up by a scavenging air stream circulating through the regenerator and vented outside the boiler house. Full-strength absorbent is then returned to the conditioners.

Ten of the 14 units at Anheuser-Busch are on a balcony adjacent to operating areas, thus do not take up with production space. Conditioned air is easily directed to the space served with short duct runs. An added advantage is the uncomplicated piping required for supply and return lines of absorbent solution.

Ductwork for moist and conditioned air is simply arranged so that all air circulated to the cool-process areas passes through the conditioners. Makeup air from outside the building is pre-cooled and sent to the intake of the dehumidifiers. Two air conditioners, located in a second-floor equipment room, also serve the cellar area. One is located in the keg-racking room.

Thus, the system has proved simple to operate and maintain.

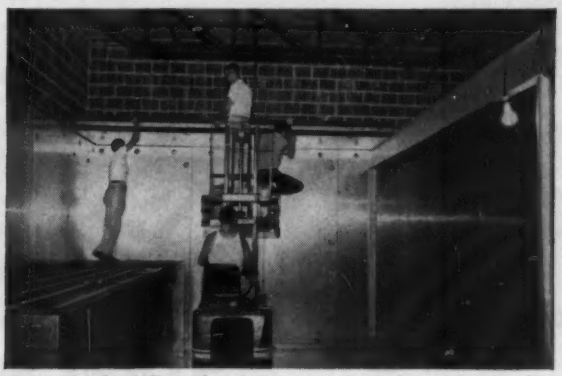
(End)

"He sneezed in our spotless labs!"

1. Unloading factory-assembled Weldwood® Armorply® modules for a 50′ x 50′ x 12′ sub-zero storage room at Wood-Fruitticher Co., Birmingham, Alabama. These metal-faced plywood sections are insulated with fiberglass.

2. Floor modules are moved into place and joined with bolts. Indoors or outdoors, Armorply modules can be erected on a concrete slab or an existing floor. And—they eliminate the need for special masonry.

3. Worker engages a patented, joint-locking device which eliminates sealing problems — an important feature of Armorply modules as factory-assembled by the Freezer Box Division, Annapolis Yacht Yard, Annapolis, Md.

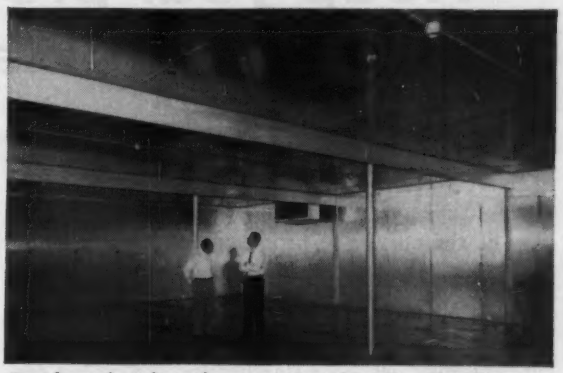


4. Armorply walls and ceiling go up much faster than cinder-block-plus-insulation construction. In addition, they need no painting, no maintenance. And they're resistant to water, dirt, and vermin.

30,000 cu. ft. of –5°F storage erected with Armorply modular wall construction in just 134 man hours

"We picked Armorply for our new sub-zero storage room mainly because we wanted to be able to expand it or move it with minimum trouble and expense," says Mr. W. C. Wood, president of Wood-Fruitticher Grocery Co., Birmingham, Alabama. Another convincing feature was the fast, easy installation.

This storage room is designed to hold frozen foods between –5° and 0°F. Other Armorply modular rooms are available for maintaining temperatures as low as –100°F. They come faced with stainless steel, aluminum, or zincbond steel. For a free Armorply sample and full details, mail the coupon today.



5. After only 2 days of erection time, this 50′ x 50′ x 12′ Armorply modular room is ready for service. It is designed to hold 400,000 pounds of frozen foods between –5°F and 0°F twenty-four hours a day.

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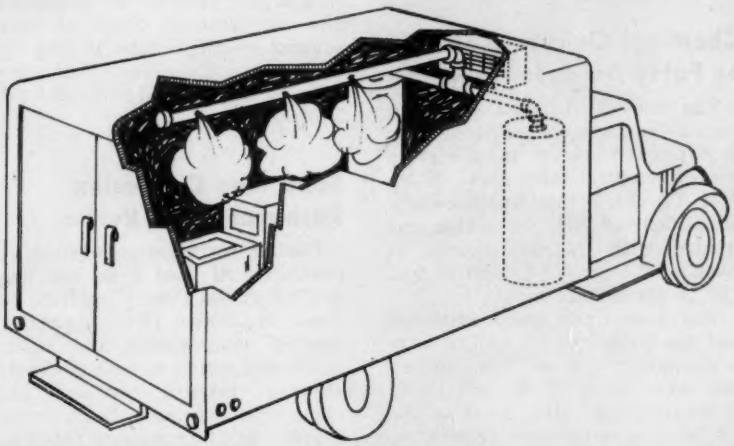
Advances in Technology



CUT-AWAY VIEW of truck shows liquid nitrogen being sprayed onto frozen food cargo from overhead pipe running along center of ceiling. Spray is released through a solenoid-operated valve actuated by a control system to give instantaneous, efficient and dry refrigeration throughout entire truck.

Liquid Nitrogen Spray in Truck Cools Frozen Food Load Quickly, Efficiently

A refrigeration system, recently tested, keeps the load in a truck at the required temperature by spraying liquid nitrogen on top of the load. This system can be installed in any frozen food delivery truck and consists of two cylinders containing liquid nitrogen, copper tubing, the control system, and necessary wiring and fittings.

The two cylinders each held 110 liters of liquid nitrogen, and were so well insulated that less than two liters of liq. N_2 boiled off in a 24-hr. period. Gaseous N_2 above the liquid in the cylinder was maintained at about 15 p.s.i. by a relief valve. A second relief valve provided precautionary relief at 25 p.s.i. This gas pressure forced the liq. N_2 into the truck when demanded by control system.

Liq. N_2 was sprayed onto cargo from a single spray pipe, attached to ceiling of truck. Pipe ran length of truck interior along center line. Holes 5/64 in. dia. were drilled in the 1/2 in. copper tubing at 1-ft. intervals. Even - numbered holes sprayed to one side and odd-numbered to the other at an angle of about 30 deg. below horizontal.

End of pipe near truck doors was sealed with a plug. Other end was connected to the two cylinders through a tee fitting. Between the tee and each cylinder was a solenoid-operated valve which was part of the control system.

Such a liq. N_2 system provides low air temperature in a small fraction of the time required by a conventional system. One cu. ft. of liq. N_2 flashes into about 700 cu. ft. of gas, forcing the warm air out of the truck through openings. Also, this system with its spray pipe extending the length of the truck insures a more even distribution of the cooling medium, both liquid and gaseous N_2, with considerably fewer hot spots.

A unique characteristic of this system is its dryness. The cases of frozen foods in the tests were drier on delivery than when conventional refrigeration equipment was used.—*Agricultural Marketing Service* (USDA), Dec., 1960.

Study on Changing Fat, Nonfat Solids in Milk

Standardizing milk to definite levels of nonfat solids (NFS) and fat may solve problem of surplus NFS as well as result in milks with more uniform nutritive value.

To test consumer acceptability, milks standardized to 2, 3, and 4% fat and 12, 13, 14, and 15% total solids (TS) were tasted by flavor panels of six experienced milk judges and 38 inexperienced judges. Flavor testing resulted in selection of samples with compositions of 2-11, 3-11, 2-12, and 3-12, where the first number represents per cent fat and the second NFS. These four samples were not readily distinguishable from each other flavorwise, and were preferred to those containing 4% fat. Samples containing 12% TS and the regular University homogenized milk tasted flat by comparison with the four samples.

In TS range of 13, 14, and 15% it appears possible to substitute 1% NFS for 1% fat without affecting flavor. Standardizing milks to definite levels of both fat and NFS makes possible: (1) standardizing the nutritive value of unit volumes of milk, (2) removing NFS from and preventing surpluses, and (3) improving flavor acceptability. — *Jour. of Dairy Science*, 1430-1434, Oct., 1960.

Metal Traces in Juices Aid Ascorbic Oxidation

Fruit juices processed in equipment from which iron or copper may be dissolved in trace amounts may undergo a catalyzed oxidation of their ascorbic acid. Small amounts of iron significantly increased the oxidation of ascorbic acid in the presence of copper. This reaction is known to yield hydrogen peroxide. The accelerating effect of the anthocyanins in black currant juice on ascorbic acid oxidation, accompanied by decolorization of the anthocyanins, may also be due to hydrogen peroxide. In this juice little if any ascorbic acid is oxidized by enzymes. Pasteurization of the juice does not decrease ascorbic acid oxidation, but metal chelating agents reduced it to very small amounts.

Addition of copper greatly increased oxidation of ascorbic acid. Traces of copper may also start reactions that can cause ascorbic acid losses under anaerobic conditions by formation of hydrogen peroxide during aerobic conditions to react with ascorbic acid, anthocyanins, and other juice components later. Iron catalyzes these reactions. Avoidance of copper contamination

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ATLAS MINERAL PRODUCTS COMPANY
MERTZTOWN, PENNSYLVANIA

of juices needs emphasis if ascorbic acid values are to be preserved.—*Jour. Science of Food & Agric.* 11(5), 258-273, 1960.

Chemical Oxidizing Effect on Fatty Acids in Flour

The use of chemical oxidizing agents for rapid maturing of flour may possibly result in a serious loss of essential fatty acids (E.F.A.). To check this hypothesis, a bread flour of 70% extraction was treated with chlorine dioxide at levels of 3.5 gm. (1X) and 35 gm. (10X) per 280-lb. sack.

The flour lipids were extracted and the methyl esters of the fatty acids were prepared. When the esters were analyzed by gas liquid chromatography, the flour at the 1X level of treatment showed no E.F.A. loss to a significant degree. After 39 days of storage the linoleic acid percentage in the flour lipids dropped to 56.4% from 63.2% in the untreated flour—a significant change. At the 10X level of chlorine dioxide the loss of E.F.A. after 39 days was severe.

It was found that the extensive loss in E.F.A. at the high level of treatment was due to oxidation by air following destruction of the Vitamin E tocopherols, which act as antioxidants for the flour liquids. Normal commercial levels of chlorine dioxide (30 ppm) have no measurable effect on the content of the major fatty acids of flour.—*Jour. of the Science of Food & Agr.*, 658-664, Nov., 1960.

Moisture Estimation in Confections by Titration

Moisture estimations in confectionery and confectionery raw materials can be readily carried out by titrations of absolute methanol extracts with the Karl Fischer reagent. A maximum of 40 min. is required for a test. Many can be made in seven or eight minutes.

The results are highly reproducible, with a precision of $\pm 1\%$ of the water content of the sample. The reagent is not absolutely specific for water, but interfering agents in confectionery or foodstuffs are rare. When materials are heat-sensitive or contain nonaqueous volatiles that would be driven off by oven drying, the Karl Fischer titration is especially advantageous.

The agreement between oven drying and the Karl Fischer method is good for samples of low moisture (up to about 6%) that require short drying periods (up to 5 hr. at 100 C.). For materials of higher moisture or those that require long drying periods, the discrepancies are greater. Some of them suggest decomposition during the drying period. —*Jour. of the Science of Food & Agric.*, 671-678, Nov., 1960.

Food Can Corrosion Researched in Berlin

Certain corrosion phenomena encountered in food cans has been studied at the Berlin Institute for Food Hygiene. Investigations covered macroscopic and microscopic evaluation as well as the fixation of existing corrosion phenomena by means of the chromatographic printing method developed by Hutschenreuter.

This method permits a precise distinction between "marbling" and corrosion, as its use is confined to the detection to iron sulfide. Cans containing certain meat products, e.g. goulash and pork, are particularly prone to develop corrosion, as they are richly spiced with products containing sulfur compounds and free fatty acids.

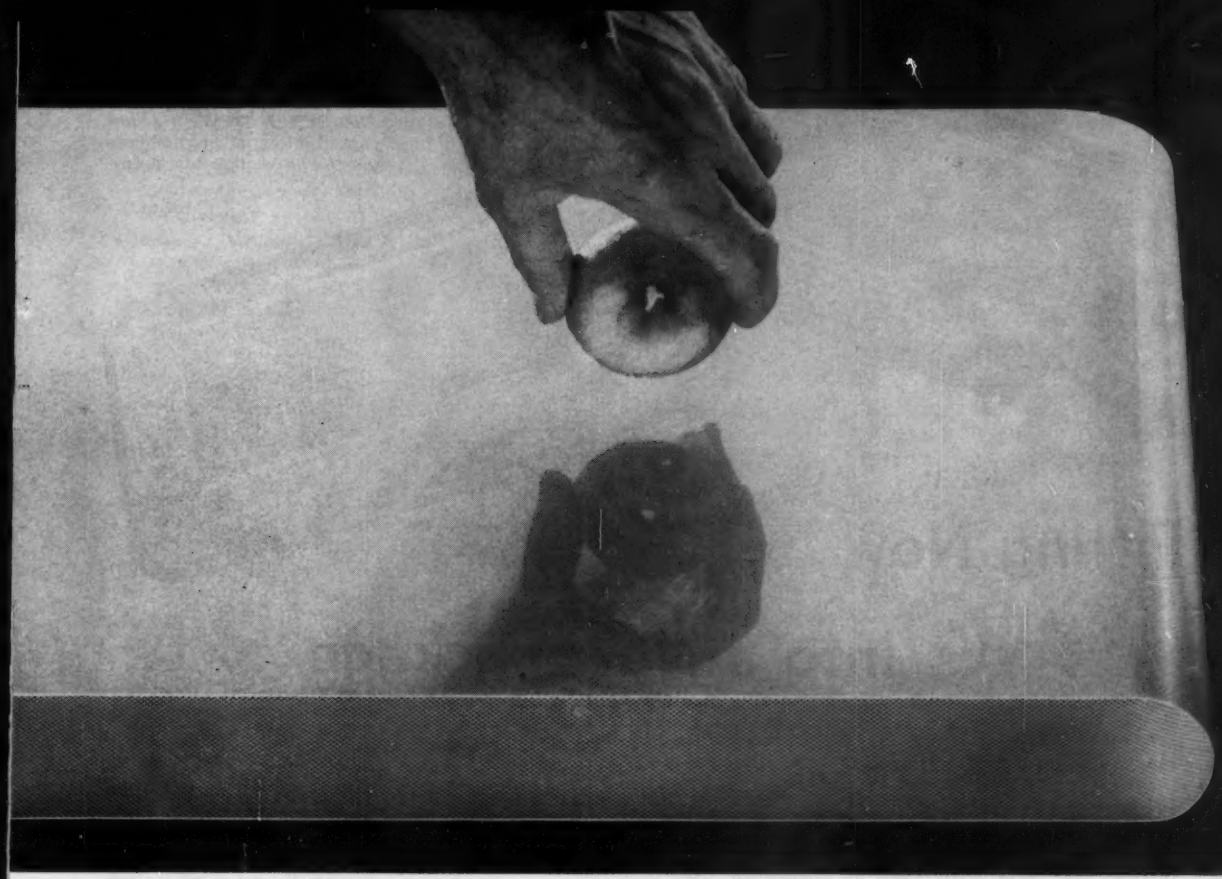
By using lacquered cans, it is possible to reduce the interaction between can metal and contents considerably. — *Die Fleischwirtschaft*, 12, 443, 1960.

Effect of Number of Samples in Panel Tests

The number of samples a flavor panel can evaluate is significant as far as meaningful results are concerned. A test was designed to study the discrimination ability of a judge when 20 different samples of a product are included in one test session.

For each of four products—canned peaches, hamburger, tomato juice, and green beans—20 samples having known flavor differences were scored for preference by a panel of 175 to 191 untrained flavor judges. The 20 samples of each product were on four trays and judged in one continuous test period, with tray order being controlled carefully.

Results of this test indicate that for mild products such as used here, up to 20 samples may be included in one test period. There was no discernible decrease in the judges' ability to discriminate flavor preferences.—*Food Tech.*, 613-615, Dec., 1960.



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Permagloss Conveyor Belting is mirror-smooth, super-sanitary, longest wearing — and actually costs less!

PERMAGLOSS is a revolutionary new kind of belting, particularly ideal for food handling. It is an *all-plastic* belting — a combination of DuPont Mylar® and Firestone Vinyl — that completely resists oils, greases, fats, and almost all acids, alkalis and solvents.

It remains odorless and tasteless, does not support bacteria growth. *And requires no maintenance except wiping!*

Permagloss belts last for *years,* often outwear other belting materials many times over — and usually cost less, too.

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CIRCLE 81 ON READER SERVICE CARD

TWO SISTER ITEMS are now packed into sparkling foil container with window board cover.

Fitting New Items Into a New Package

If you've gone into the cost of package development for one of your products, why end there? Here's what a midwest packer did by developing a new item to go into a foil tray with built-in consumer convenience

HALF THE BATTLE'S OVER in your new product - development program if you've got a brand new package. This is especially true if the package has already been adapted to one of your new items that's had some success. Such has been the thinking of Patrick Cudahy, Inc., Cudahy, Wis. And it's one way this packer has been able to chip away on his package development costs.

Patrick Cudahy several years ago developed a product—a precooked, smoked, skinless sausage link (Smokie Treats)—to fit a new package with built-in consumer convenience. Package (Ekco-Alcoa) consists of a 0.0035-in. rectangular aluminum tray (44 11/16 x 9 1/16 x 27/32 in.), with corrugated bottom and window board cover. Bottom permits cooking of product (packed perpendicular to corrugations), yet keeps it separate from grease collected in built-in moisture grooves, thereby producing finer-tasting, unscorched sausages. Waxed cover (both sides) contains anti-fogging polystyrene window to offer partial visibility. High gloss wax cover (Marathon) is 4-color printed, and features blue (for Smokie Treats) and green (for new product, Bacon Treats) product-identifying bands.

New vertical flange tray is a development over original one (still used), on which paperboard-packed sausages were cellophane-overwrapped and heat-sealed. Since introduction of new foil tray, Patrick Cudahy's sales of this sausage product has about tripled over two-year span.

Package's success has stimulated the company into eyeing the possibilities of developing new products to fit the new package. Result has been the recent introduction of a sister item, the previously mentioned Bacon Treats. Like Smokie Treats, it's packed ten links to a 12-oz. tray.

New product development (Patrick Cudahy is also eyeing the possibility of others) came about this way: Sought was a more profitable way of using bacon-end trimmings on the sliced bacon line. Up until now, they were No. 3 selling item as bulk-packed ends and pieces. Research department tried working these ends into club sausage and loaf items, then found a new "home" for them by first frying and then blending them into a sausage emulsion. Like the sausage product, the emulsion is stuffed into a cellulose casing that's machine-linked. Links are then hung on cages for processing through smoker, cooker and water rinser before casings are stripped off by machine, ready for packaging.

How Package Developed

When Patrick Cudahy originally adopted the new foil tray, it employed a 7½-mil polystyrene lid (biaxially oriented), printed flexographically in the four colors (red, yellow, brown, blue or green) now used. But this plastic cover sometimes popped out of the container, since it didn't offer sufficient bite for the crimp-sealed aluminum flange. Further, the product, on occasions, supported the cover (from below), and pulled the lid away from the flange.

Latter problem was solved by quality control department's maintaining diameter of the links more closely. At one time, the links' diameters varied ⅛-3/16 in.—sufficient to bulge the covers.

Still the lids popped out during distribution. So Patrick Cudahy's package designer, George Jacklin, got into a huddle with suppliers and came up with a solution. He switched to the window board cover that offers a "bite" for the foil flange which is practically embedded in the better gripping paperboard. For additional safe-

JOHN V. ZIEMBA
Senior Associate Editor, "Food Engineering"

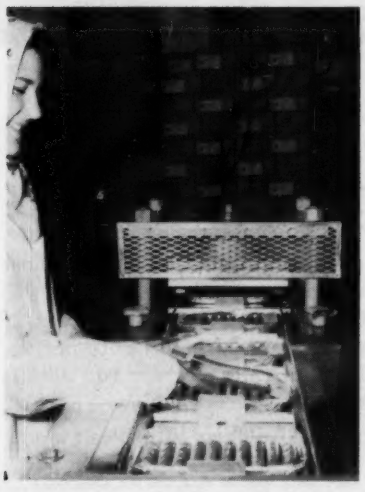
guard against the cover popping off the foil tray, Jacklin had production department install a lid-closing machine that would provide annular groove closures. Machine's two closing dies now peripherally crimp lid to tray, lock cover between top and bottom flange for more secure gripping.

And still the problem of container damage wasn't licked until the company developed a better method of packing the trays into shipping containers. Rough handling during distribution often resulted in badly beaten up trays. Solution was to insert two trays (back-to-back) into a "shock absorber"—a double-fluted cardboard collar. Eight trays are packed in this manner for loading into a single-fluted shipping case that's gummed paper-tape sealed.

Better Closures—Faster

Previously, the single-head, lid-closing machine could only handle 30-35 trays/min. This air-hydraulic unit contained a shuttle-type tray feed and two dies that crimped tray flange around the former type plastic lid. Top male die had a dozen prick-punch shaped lances that meshed with holes in lower female die. Lances perforated foil and polystyrene lid to lock the two together and prevent lid-shifting.

New Machine (Ekco-Alcoa), in addition to operating at a higher speed (50 trays/min.), offers a more positive closure, Here, window board lid is placed on tray's annular groove, then firmly sealed



NEW SINGLE-HEAD CLOSURE machine now handles 35 trays/min., assures more uniform and neater closing of lid with tray. Max. rate is 60 trays/min.

CONVENIENCE is stressed in this foil tray with bottom "moisture grooves" to give burnercooked products unscorched flavor.

in place by two dies that corrugate foil and paperboard lid. This way, foil and lid aren't broken, so seal has good barrier properties.

The new machine offers more secure and uniform closures in another way. Closure pressures (with every stroke of the machine) are more consistently uniform, since self-contained, mechanically operated unit doesn't (as with former machine) require often-fluctuating plant source of air pressure.

Patrick Cudahy's production manager, Frank Hand, says: "There's something else about the new closure machine that aids in the production of more uniform closures. It's the method of feeding trays through the unit. New machine is equipped with an indexing flight chain that's synchronized with closure dies. Flight chair carries trays to, through, and from the closing machine. Not so with former unit whose reciprocating-type shuttle, in-feed conveyor only fed the trays to closing dies, with the next-in-line tray then pushing the lid-closed tray from the machine."

Wide Product Promotion

In the convenience feature of the heat-'n'-serve foil tray, according to the Cudahy firm's advertising and promotion manager, Jerry Chesterton, there is a singular merchandising advantage. With proper promotion, it can be used to pep up lagging sales. Since package moves so well, company's salesmen throughout a 32-state distribution range use it as a leader to get into new areas.

To identify Patrick Cudahy as the "Home of Sweet Apple-Wood Smoke Flavor," package's cover design carries a colored picture of a cluster of apples on a leaf-covered branch. Smoking these products with sweet apple wood imparts the well-known Patrick Cudahy distinctive taste to them.

Before these new products were introduced, the company cautiously sought the reactions of an outside, independent test panel. The panel's reaction and comments signaled the company to move ahead.

These two aluminum tray packed products are promoted chiefly through store demos, arranged by salesmen. Then ads are followed through via spot radio commercials and newspapers (usually 1-page, two colored with use coupons). Chesterton says company gets an excellent return on these coupon-type ads. A mat service is furnished to retailers for cooperative newspaper advertising.

To get additional store display space, spot merchandisers—electrically operated, refrigerated coolers (2½ x 3 x 4 ft.)—are employed. These merchandisers (with the company's logo) are brought into stores by salesmen, who load them up. However, retailer agrees to maintain company's products in regular refrigerated displays.

Additional promotional materials are also provided for stores. These include POP material, banners, display inserts and other sales aids. (End)

TO SAFEGUARD TRAYS during shipment, two are inserted within a protective corrugated paperboard collar before being packed into a shipping case.

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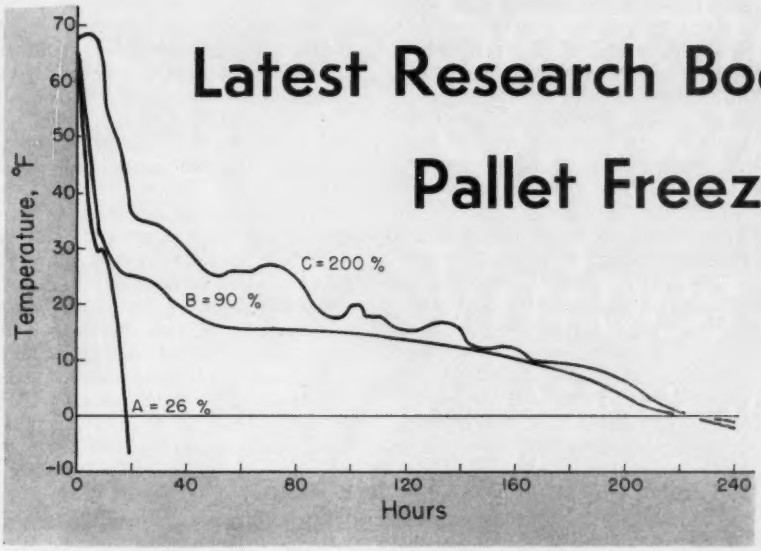
JOHNS-MANVILLE

Latest Research Boosts Pallet Freezing Efficiency

Unless rapidly frozen, foods can suffer substantial quality loss. New concept of 'high-quality life' gages the effect



FREEZING-RATE CURVES for three commercial strawberry-processing plants show how rapid cooling—especially in the initial stages—minimizes quality loss. Percentage figures are related to quality loss by simple mathematical correlation developed by authors.

PART II—

Effect on Quality

HOW QUALITY of frozen foods is impaired by improper storage temperature has been well established by extensive research. However, this work was almost entirely concerned with quality and other changes occurring in products **after** initial freezing.

That commercial practice in pallet-load freezing of strawberries varies considerably was shown in Part I of this paper (FE Jan. '61, p 84). The resulting large variations in the time required to bring products down to zero F. could have an important effect on quality of the berries even **before** they reach zero F. for the first time. Therefore, we determined the effect quantitatively.

'High-Quality Life'

Quality attributes considered in this study were flavor and color, since sensory changes in these properties can be gaged with high reliability by a trained panel.

GUADAGNI, D. G., HARRIS, J., and SANSHUCK, D. W.
Western Regional Research Laboratory, USDA, Albany, Calif.

For reference, samples were placed at —20F. (control), and at a higher steady temperature (10 or 20F.). When 70-80% of the panel could distinguish between samples, it was considered that deterioration of color, flavor, or both had occurred.

The **time** required to produce this change is the 'high-quality life' at the temperature in question. It represents the time-temperature combination that causes just enough deterioration to make the product distinguishable from essentially freshly packed material.

A shorter experience at the same temperature 'uses up' a part of that 'high-quality life.' A particular time-temperature experience might also use up more than 100% of it.

TABLE 1—
HOW STORAGE TEMPERATURE Affects 'High-Quality Life' of Sliced (4+1) Strawberries

Temperature (Deg. F.)	Average High-Quality Life
70	11 hr.
60	14 "
50	22 "
40	36 "
30	3 days
20	10 "
10	66 "
0	365 "

In frozen strawberries, for example, it takes an average of 10 days at 20F. for this degree of sensory discrimination. Thus, 'high-quality-life' at 20F. is 10 days. While not necessarily associated with consumer acceptance, this concept has given consistent and reproducible results.

Percent 'high-quality life' used up in the berry-freezing operation was calculated for 75 pallet-freezing-rate curves obtained in 11 plants in California, Oregon, and Washington. They reveal that:

No plant was freezing fast enough to keep loss of 'high-quality life' below 25%, but at that point the change is not perceptible.

At the fastest rates found in the survey, 46% of the plants were using up 50-100% of the 'high-quality life' of the product.

At the slowest freezing rates, 36% of the plants used up 100-200% of 'high-quality life' during the freezing step.

Average change during freezing was 79% of the 'high-quality life' for all plants, but those better operated held the change down to 25-50%, irrespective of case or pallet position in the freezer.

TABLE II—

QUALITY LOSS in Commercial Plants

Percentage of High-Quality Life Lost During Freezing to Zero F.	Percentage of Plants Tested* Slowest Rates	Fastest Rates
0- 25	0	0
26- 50	45	18
51- 75	28	18
76-100	18	28
101-200	9	36

**Only the fastest and slowest freezing rates in each plant was considered.*

Fast Freezing Required

Average 'high-quality-life' of several different lots of 4+1 sliced strawberries obtained during the '57, '58, '59 seasons is shown in Table 1. Note how 'high-quality life' increases very rapidly as temperature is reduced from 70 to zero F.

Data in Table 1 were determined by storage at uniform steady temperatures. In pallet freezing, however, temperatures vary until product reaches storage-room temperature. Problem is to convert the variable temperature history to that time at a steady temperature which will produce the same quality change caused by the variable temperature history. This was done by graphical integration*.

Suppose a given curve converts to 5.8 days at 20F. From Table I, the experimentally determined 'high-quality-life' at 20F. is 10 days. Thus, this particular freezing rate has caused a loss of 58% of original 'high-quality-life.'

Curves from each plant represented an approximation of the best, worst, and intermediate freezing rates.

The fastest and slowest individual rates used up 26% and 200% of the 'high-quality life,' respectively.

The eleven fastest freezing rates encountered in the survey caused losses in 'high-quality life' ranging from about 26% to 100%. The eleven slowest rates averaged 100% and ranged from 30 to 200%.

Table II gives an overall picture of frequency of given degrees of quality change found in the 11 plants. Those with low quality loss completed freezing in air blast tunnels at —15 to —30F., employed spacers between layers of cases, and maintained a reasonable distribution of cold air. In other plants, there was a two to three fold difference in quality loss between the most and least favorable case positions.

Our lead illustration shows freezing-rate curves together with designation of percent 'high-quality life' used up in three of the plants tested, curves A and C representing the fastest and slowest rates.

The interesting comparison, however is between rates in B and C. Although time to reach zero F. was the same in both cases, rate C caused over twice the quality loss experienced in rate B. Reason is much faster initial cooling in B.

Cooling rate from initial temperatures of 60-70F. down to 15F. or lower is much more important than from 15F. to zero F. because of the greatly increased rates of quality loss at the higher temperatures (Table 1). Significantly, it takes 113 hr. at 10F. to cause the same quality loss that occurs in only 1 hr. at 60F.

Therefore, total time required to reach a given temperature can be grossly misleading unless something is known about initial rate of cooling.

Under freezing conditions that cause losses of 90 - 100% of 'high-quality-life,' flavor and color changes are easily noticeable. When as much as twice the 'high-quality-life' or losses equal to storage at 20F. for 20 days are experienced, both color and flavor of frozen strawberries are seriously degraded.

Even under the best freezing conditions found, the original frozen berry will start its journey in the distribution channels with 25-50% of its 'high-quality-life' already used up.

Since this quality loss merely adds on to any additional losses which may occur during distribution, noticeable quality degradation can appear sooner because of the changes initiated during pallet freezing.

Finally, it should be emphasized that pallet-freezing operations and frozen-storage temperatures are only two of many factors which can affect the quality of frozen strawberries. Variety, maturity, raw material handling, processing procedures, and many others can and do influence quality of the final product. However, regardless of meticulous attention given to these other factors, high quality will not be assured unless products are properly frozen and stored. (End)

*Van Arsdel, W. B. and Guadagni, D. G., *Food Technology*, 14-19, Jan. 1959.

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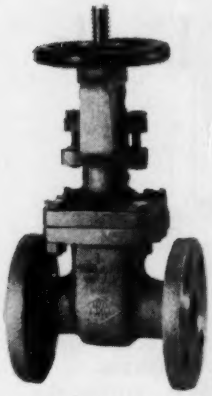
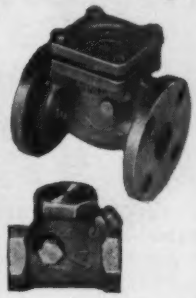


Most of the alloy specs were developed to meet certain highly specialized and rather uncommon needs. Only 1 out of 100 valve users can make practical use of many of the alloys. *Actually, just two or three of the different available alloys will give a big majority of valve users all they want and need.*

You can judge DESIGN differences between the various "makes" exactly as you do it with Bronze and Iron valves. Look them over and compare. Basically, of course, a Stainless Steel valve is designed and constructed very much like other valves.

What is left to worry about in addition to Material and Design? The same factors you consider in buying ANY valves for long, dependable performance: Are the valves made merely good enough, or to a standard that demands an extra-measure of quality? How good are the castings? How precise and perfect is the machining? How rigid is the inspection and testing during manufacture? These are the factors which specs can't cover. Some of them you can't see when you look at the valve. But you KNOW how to make sure they measure-up to peak standards. You know that the name JENKINS VALVES and the famous Jenkins DIAMOND trademark have been the highest assurance of quality for nearly a century.



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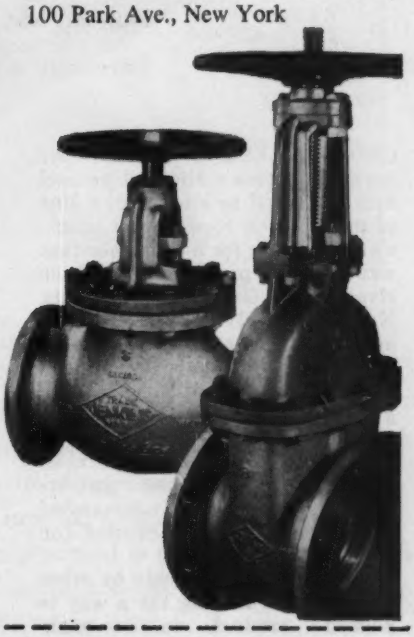

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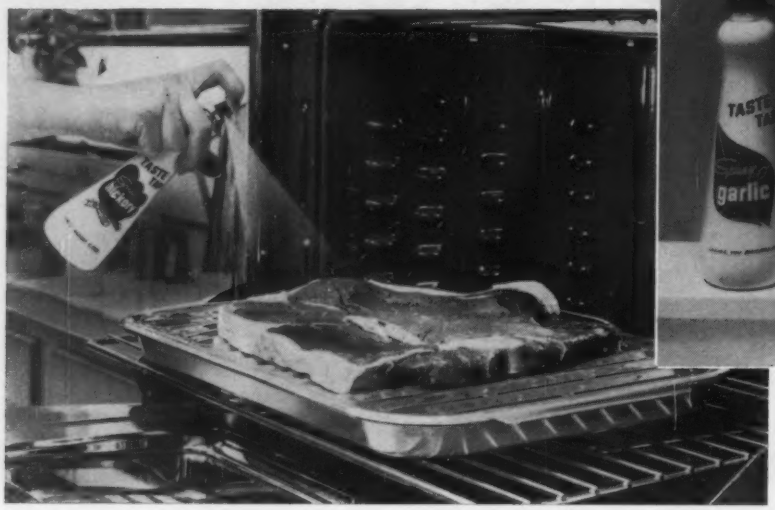

SPRAY DISPENSING gives more uniform coverage of product, allows even penetration. First four aerosols in new line (insert) include garlic, hickory, onion, and meat tenderizer.

Plasticized Bottle Gives 'Different' Look

Hustling Midwest aerosol packager puts over spray-type flavorings with container borrowed from cosmetic field

CROSS-BREEDING — that's the packaging trick a Midwest aerosol firm pulled off to give its new line of push-button foods a fast break-away. Aiming for a container that would set its products apart from rival entries, Gard Pressure Foods, Northfield, Ill., successfully adapted a non-aerosol glass container used in the cosmetics field.

Bottle is a 3-oz. cruet-shaped glass container, polyethylene-coated on outside for added strength and shatterproofness. Suitable for food aerosols that are pressure-dispensed in non-aerated form, it is silk-screen printed (on poly coating).

Container merits study by other food packers looking for a way to package products to be push-button-dispensed in spray, rather than foamy, form. Once the problem of non-foamy dispensing of aerosols is licked, there will probably be a stream of "push-buttoned" foods packed in pressurized glass containers.

Gard's bottle, result of 3-yr. of research with aluminum and enamel-lined cans, is being used to preserve-package a brand-new line of convenience foods. Anti-corrosion linings used for tin cans didn't work for Gard's products because of latter's high concentrations of salt and vinegar, says Pres. H. G. Klehm. Company finally went to inert, linerless glass.

Package Boons

Container's use-convenience and long flavor retention (because it's never opened) partially compensate for the comparatively high 79¢ price (which covers 20¢ package cost). And the products' long use (over several months) helps to flatten the higher retail tariff.

Also significant is the development of a dispenser with a tiny spinner in valve's expansion container. It builds up product stream into a non-foamy spray pattern.

Gard employs a nitrogen-gas propellant for constant pressure throughout dispensing. Propellant leaves no residual product after gas is exhausted, serves as a "blanket" to prevent product-deteriorating oxidative changes.

Dispensing head is protected with a transparent cap that blocks discharging during shipping and other handlings. It also identifies container as an aerosol-type unit.

Klehm points to three other gains:

. . . Product dosages are more uniformly controlled. This is true with flavor- and meat tenderizing-type items. Spray-dispensed flavors cover products more evenly. Thus, when tenderizer is used, meat is more uniformly treated because of even distribution and faster, deeper penetration.

. . . Attractive-looking containers provide decorative table setting. They're even attractively gift-packaged as a "Gourmet's Delight" assortment.

. . . Preparation of salads, snacks, soups, and main course dishes is simplified. Onion flavor product,

NASH PUMPS for higher Vacuums

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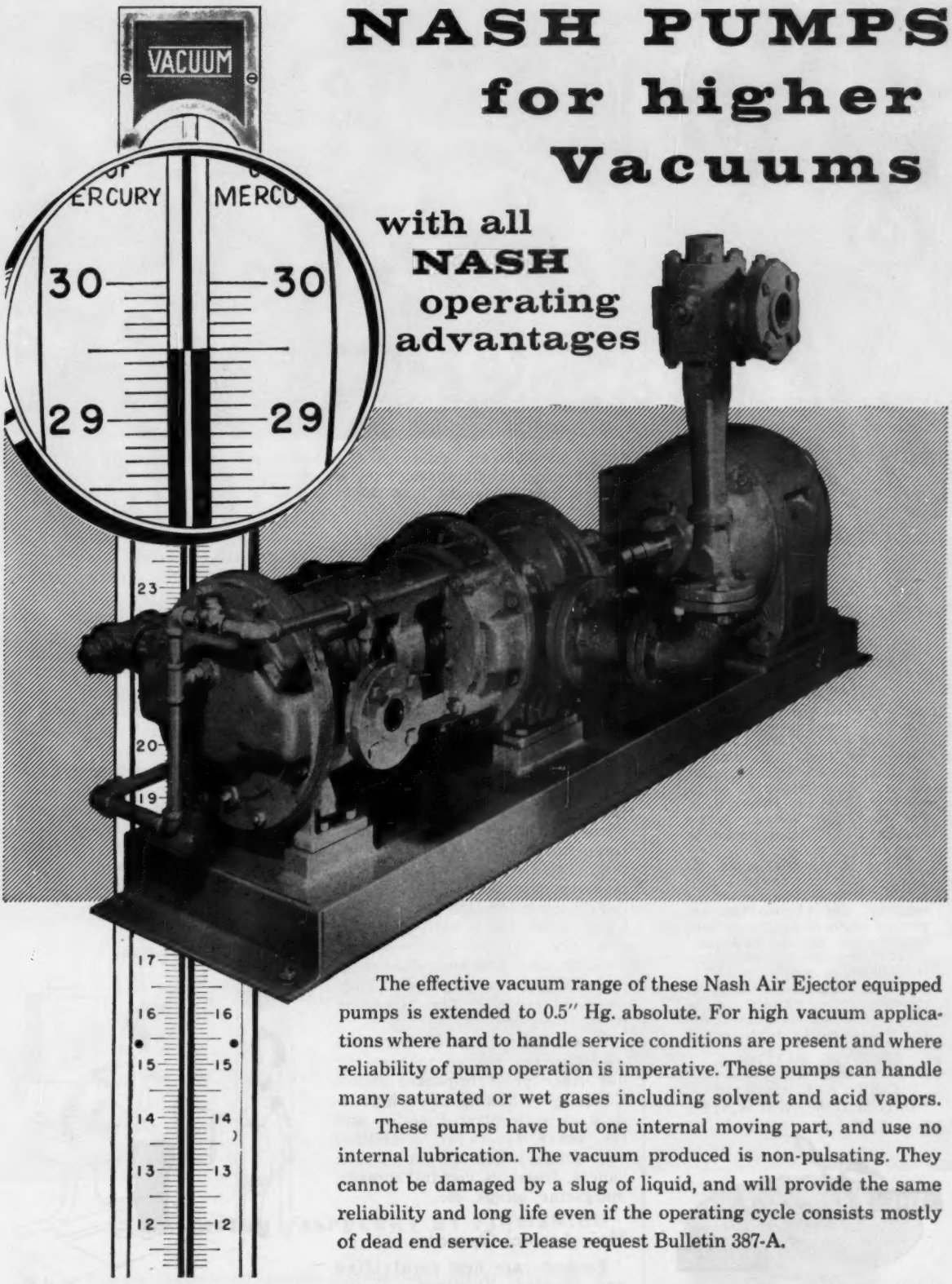

The effective vacuum range of these Nash Air Ejector equipped pumps is extended to 0.5" Hg. absolute. For high vacuum applications where hard to handle service conditions are present and where reliability of pump operation is imperative. These pumps can handle many saturated or wet gases including solvent and acid vapors.

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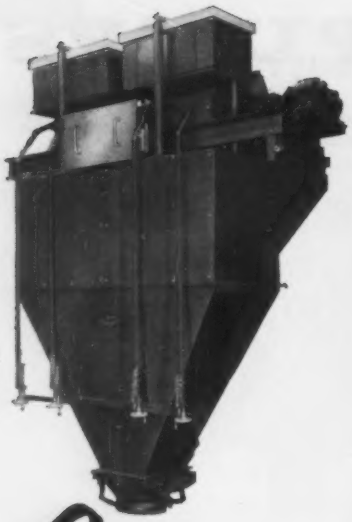

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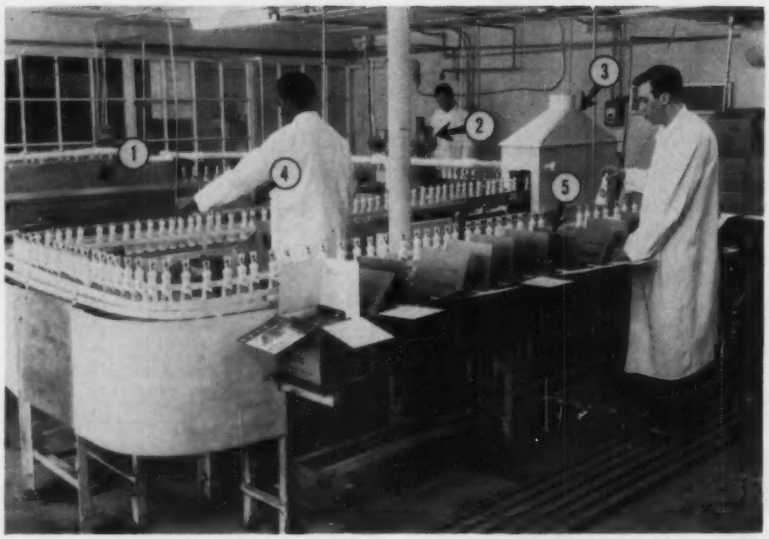


FILLED CONTAINERS go through: First washer station (1), pressure tester (2), second washer (3), tipper-capper (4), and, finally, case-packer (5). Gard developed most of own equipment from 30 cpm pilot line to new rate of 120 cpm.

for example, eliminates peeling, chopping, cooking, tears, and scent (on hands).

Four years ago, Gard pioneered in developing a non-dairy line of aerosols. Firm originally came out with soft drink flavor concentrates (orange, grape, strawberry, and lemon-lime) packed in 12-oz. enamel-lined aerosol cans. Products are a blend of sugar, sucryl, saccharin, and flavor.

Company now offers four products—Spray O'Garlic, Spray O' Onion, Spray O'Hickory, and Spray O' Tenderness (meat tenderizer)—in the new plasticized bottles. Products are emulsified to make them more stable.

Test-marketed in several key areas before going national, products are handled by some 50 brokers, and are supported with spot-TV and newspaper ads. They are displayed in condiment section of retailers' shelves.

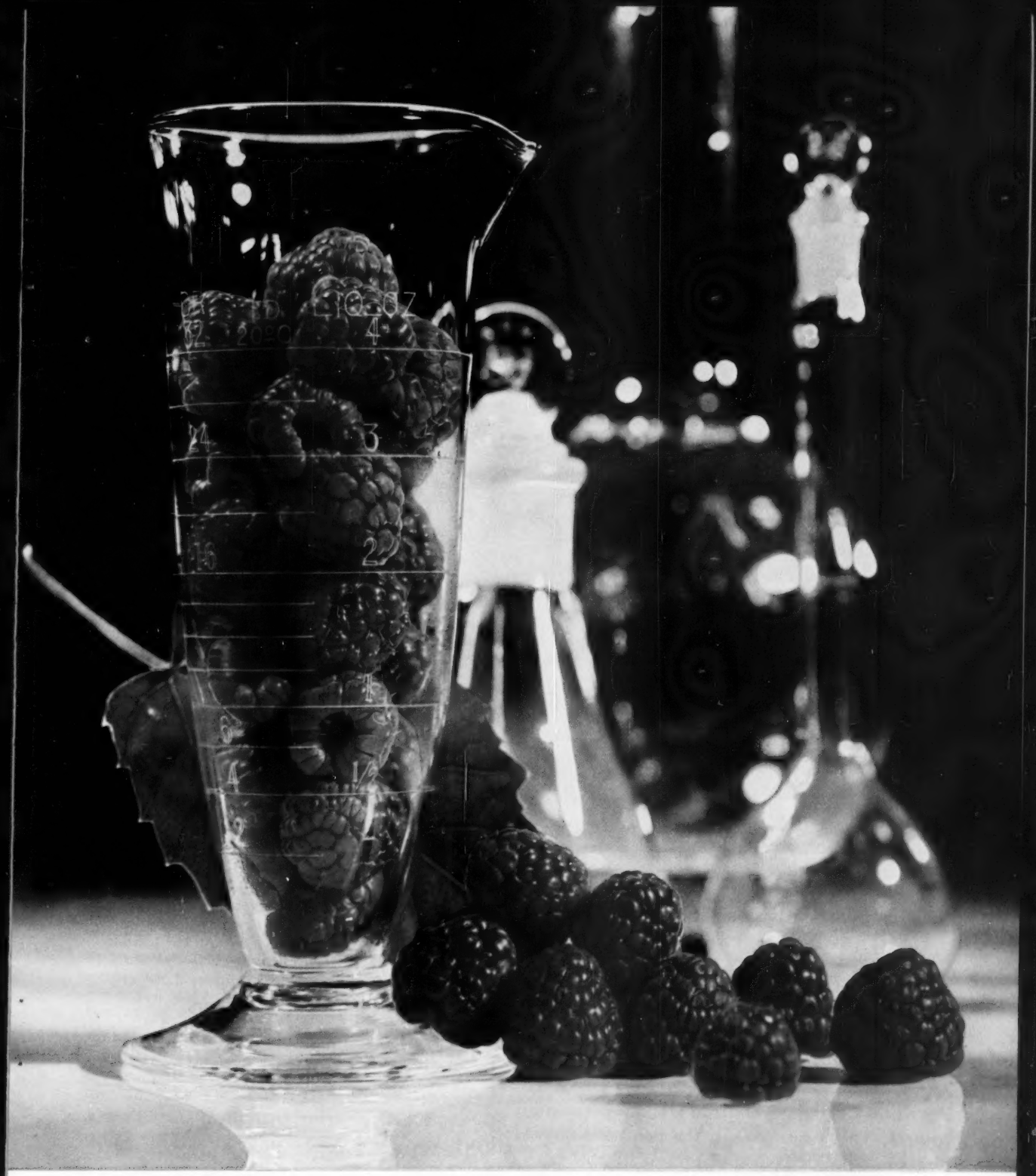
New container gives Gard the breakthrough needed to research out other pressure-packed items. Company is looking at such products as concentrated coffee and tea, other flavors or solubilized seasonings, lemon and lime juices, sauces, dressings, cocktail spreads, margarine, icings, etc.

How Aerosol Operates

Products are first emulsified and blended. Continuous recirculating line—from kettle to filler—is dual-controlled through: (1) limit switch (to time-control product's uniform flow), and (2) variable-speed pump. Weight-filled bottles then proceed to CO_2 purger that's synchronized with filler and subsequent units. Here, valves are manually dropped into jars before they continue to the automatic, single-bell crimper. Next, nitrogen is charged (90-100 psi) into containers by a pneumatically-operated, 12-head gasser.

After containers emerge from 4-ft. washing tunnel, bottle pressure is measured, with those containers below pressure being pneumatically rejected. Containers are washed again before they're finally tipped (spray heads inserted), capped, and packed a dozen to a display-type "shipper." (FE Staff)

"Did you take the marshmallow whip that comes in an aerosol can just like your shaving cream?"



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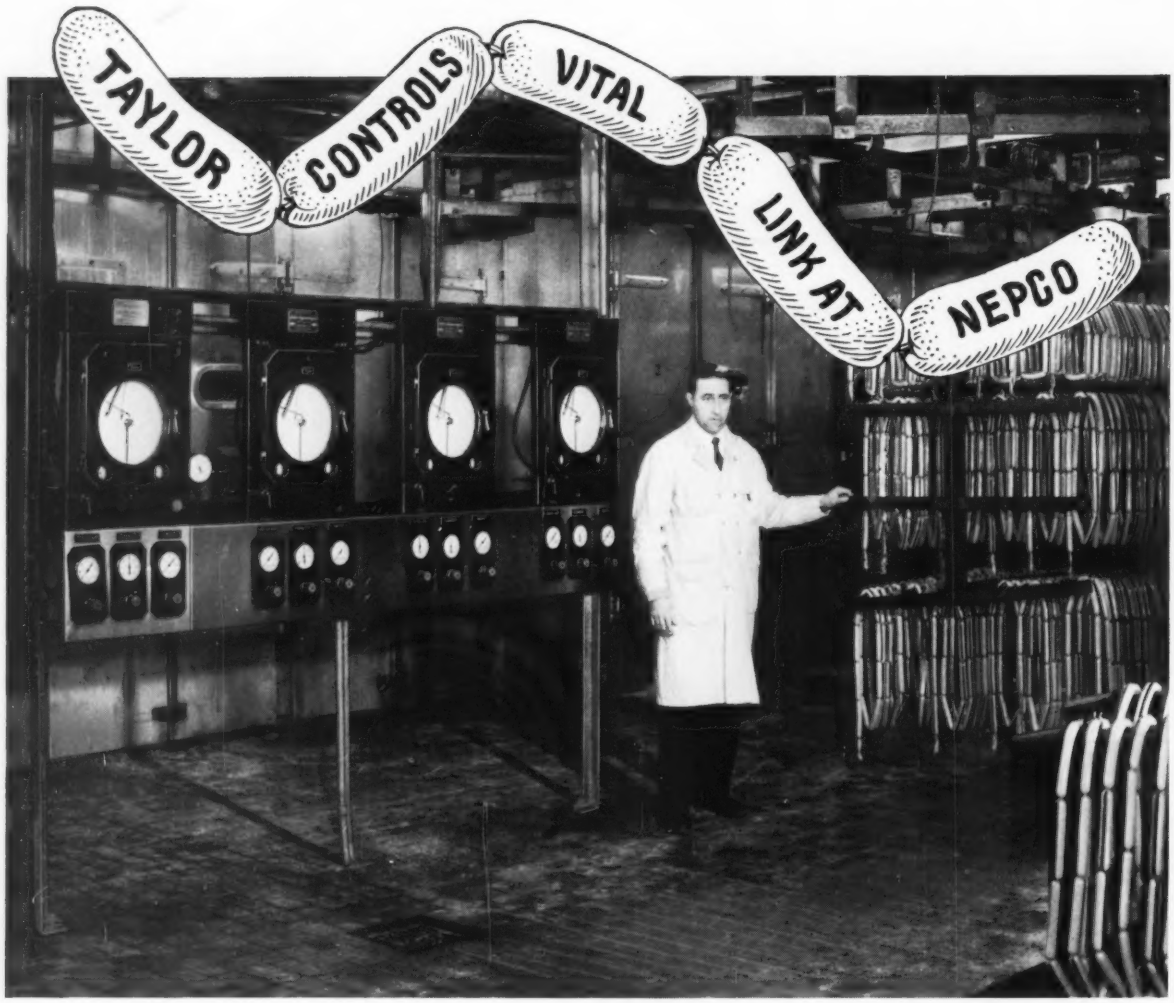

New England Provision Co. uses Taylor Smokehouse Control Systems to minimize shrinkage, shorten smoking time and cut operating costs . . .

All the Julian smokehouses at the New England Provision Co. plant in Boston are under Taylor control. That's one reason the company continues to enhance the reputation of its NEPCO Brand Frankfurts, Bologna, Pastrami and Rolled Beef.

In the picture above Anthony Camelio, Supervisor, stands in front of four Taylor FULSCOPE® Recording Wet-and-Dry Bulb Controllers used to regulate process humidity and temperature. The dry bulb control adjusts the main steam valve to maintain a constant temperature in the smokehouse. The wet bulb control keeps humidity constant by throttling the spray water valve and positioning inlet and outlet dampers to control the amount of recirculation.

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Concentrated Beer Raises Hot Issues

It could revolutionize production and marketing of beer—and put the small brewer out of business

PARTIAL DEHYDRATION of beer —probably the most revolutionary and controversial idea ever presented to brewers—has been proposed by Union Carbide Corp., New York City (Federal Register, Dec. 28, 1960).

In a petition to amend Federal beer regulations, UC requests regluations to provide for:

1. Production in a brewery of a concentrate from beer by removal of water.

2. Reconstitution of beer from such concentrate by brewers by addition of water and carbon dioxide.

3. Qualification as breweries of plants concentrating or reconstituting beer.

4. Transfer of concentrate between breweries belonging to the same brewer, and

5. Exportation of concentrate without payment of tax.

Handling of concentrates by persons other than those qualified as brewers would not be permitted under the proposed regulations.

Reconstituted beer would be treated for all purposes, including payment of tax, the same as beer which had not been reconstituted.

UC owns U. S. and foreign patent rights to a freeze-concentration process that removes water as ice crystals, a technique used in concentrating orange juice (FE, Oct. '51, p. 68). Thus, the original beer volume can be reduced to as little as 25% without a significant loss of flavoring components or alcohol.

Threat to Small Brewer

UC would offer brewers nonexclusive licenses to practice the process. Hearings on the proposed amendments are scheduled for Mar. 21, 1961 in Washington, D. C.

Swift negative reaction came from the Brewers' Assn. of America, which sees in the proposal a disastrous threat to the small brewer.

Because of the local nature of his operation, he stands to gain nothing from the new product. Moreover, substantial competition from reconstituted beer could put him out of business fast.

On the other hand, the large brewer with several strategically located plants would enjoy tremendous savings in shipping the concentrate in tank trucks or cars. True, savings would be offset by the cost of equipping reconstituting plants. But the brewer could then run a single plant at full capacity, rather than several at partial capacity—which would cut production costs substantially.

From the marketing standpoint, no brewer would want to label his beer for domestic consumption as 'reconstituted,' while his competitor continues to sell the conventionally produced product. Label regulations will be discussed at the forthcoming hearing.

Although present Federals laws may be broad enough to authorize some of the regulations under administrative procedure, such revolutionary proposals should, in the opinion of the Brewers' Assn., be the subject of new legislation by Congress.

Meanwhile concentration of beer by heat in a low-temperature vacuum evaporator also is under study. The first 10% of the water removed contains most of the alcohol and flavor. It is added back after concentration is completed. This process is claimed to be more economical than freeze-concentration. (FE Staff)

in dry mixes; breads and rolls; sweet goods and coffee cakes; biscuits, muffins; waffles and pancakes, etc.

NOW AVAILABLE . . A NATURAL INSTANT FERMENTATION FLAVOR . .

that imparts true yeast-leavened flavor and aroma in chemically leavened baked goods without time consuming dough fermentation.

VICO 400, a unique NATURAL flavoring captures the full spectrum of flavor notes characteristic of natural yeast fermentation.

VICO 400 initiates a new concept of flavor production. It brings out — INSTANTLY — a true yeast leavened flavor in various baked products, thereby intensifying and improving their taste appeal. It is especially effective with the blander types of chemical leavening agents.

VICO 400 is a dry, highly stable flavoring in powder form, easy to handle and ready for use at any time.

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Manufacturing Chemists to the Food and Pharmaceutical Industries.

Men & Companies

John M. Fox

Fox Resigns MM . . . John M. Fox, president and advisory board chairman of Coca-Cola's Minute Maid Div., moves over to executive v.-p. post at United Fruit Co. His successor is Holman R. Cloud, executive v.-p. and member of the MM board since '45.

Founder of Minute Maid, Fox has headed the organization since its inception 15 years ago. Following the announcement of his resignation, he stated that his "decision was arrived at only after long and painful deliberation and was in no way influenced by the merger with Coca-Cola." Minute Maid became a division of Coke in December when stockholders of both companies voted overwhelmingly in favor of the merger.

Acquisition is Coca-Cola's first departure from the soft drink field in its 75 year history. Industry sources inform FE that Coke was prompted by expansion possibilities in canned beverages and intends utilization of MM experience in this area.

Mr. Fox further stated that he "will be undertaking new and challenging responsibilities as an executive v.-p. of United Fruit and will make good use of his wealth of experience working on solutions to current problems in the banana industry, similar to those that faced Florida citrus growers 15 years ago."

William A. Coolidge

Clayton C. Daley

Drake Ups Two . . . John G. Loeffler and Clayton C. Daley have been elected sales v.-p. and manufacturing v.-p., respectively, at Drakes Bakeries, Inc. Mr. Daley has also been elected to the board.

Mr. Loeffler joined Drake in '28 and became manager of the firm's Newark bakery in '53 and manager of its Brooklyn unit in '54. He was named director of sales in '59.

Mr. Daley joined the company in '58 as assistant to the director of production. He was later named director of production. In addition to his Drake affiliation, Mr. Daley has served with Nickles Bakery and Wesley Baking Co.

Drake, a subsidiary of The Borden Co., operates bakeries in Newark, N. J., Boston, Mass., Long Island City and Brooklyn, N. Y.

Personnel

Edward C. Parker, Tetley Tea president, is new board chairman of Tea Council of the U.S.A., Inc.

William R. Boberschmidt and **B. A. Childs** have been elected v.-p.'s at Oscar Mayer & Co.

Donald R. Keough becomes board member at Paxton & Gallagher Co.

Adams W. Dutcher moves up to production v.-p. at Dulany Foods, Inc.

Frederick E. Ossario has been elected a board director at The American Sugar Refining Co.

T. H. Stanley retired as board chairman of Royal Crown Cola Co. after 35 years' service.

J. Douglas Casey becomes board member of Consolidated Foods Corp.

Walter Mercer has been appointed assistant director at Berkeley lab of National Canners Assn.

Frederick M. Tobin moves over from presidency to board chairmanship and senior officer at Tobin Packing Co. He is succeeded by **Herbert Rumsey Jr.**

W. B. Murphy, Campbell Soup president, is re-elected member of National Industrial Conference Board for one year term.

Charles M. Kelly takes over as marketing v.-p. of International Breweries, Inc.

Robert S. Wheeler, former advertising v.-p. at American Home Products Corp., moves over to Corn Products Sales Co. as v.-p. and new products marketing director.

Miles Kehoe is now food and grocery products marketing v.-p. at Hunt Foods.

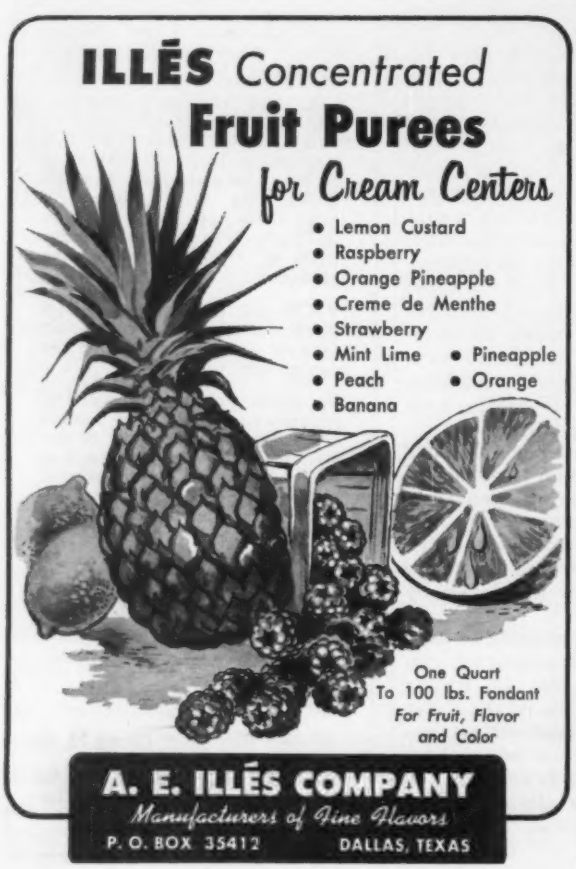
Oscar L. Westgate, advertising v.-p. at R. T. French Co., retired after 32 years service.

Lloyd B. Sheetz becomes marketing v.-p. at Curtiss Candy Co.

Edward D. Barrett moves up to v.-p. of Standard Brands Sales Co.

C. Harry Bleich, former president in charge of sales of California & Hawaiian

(Continued on Page 97)



Understanding the packaging problem completely is to know how to solve it properly. That's why Triangle invests so many man hours in Preliminary Engineering. We do it to make a proposal just as carefully as before engineering a machine already on order. As a result you can depend on the equipment you're ordering, and we can guarantee it.

Will your next packaging machine perform as well as Oh Henry's?

It will *if* the machinery builder is able to understand your particular packaging needs as well as Triangle understood those at Williamson Candy Company, Chicago, Illinois.

Whether you want to package miniature Oh Henry candy bars in poly bags or not, Triangle's consideration of *your needs* always begins in Preliminary Engineering. Everything that relates to the situation is analyzed and fitted into its proper place. The result is an outline of needs so complete as to permit the most practical, direct solution.

In this instance, both Williamson and Triangle knew specifically what was needed—type of machine . . . how fast it would operate . . . floor space requirements . . . how quickly the investment would be amortized—all was determined in advance.

The machine that satisfied all requirements was the Triangle single tube Bag Maker and Filler. The four machine installation is equipped with Elec-Tri-Pak scales for high speed, accurate, fully automatic operation. This remarkable single tube machine is also available as a twin, featuring independent operation of either tube.

Like so many other users of Triangle machines, Williamson Candy Company already knows what we want to show you. Why not write for our free brochure, "A Story About People, Packaging and Profit." It tells why you can depend on Triangle.

Williamson Candy Company uses a battery of Triangle Bag Maker and Filler machines to automatically package miniature Oh Henry candy bars in 7, 9, and 14 oz. printed polyethylene.

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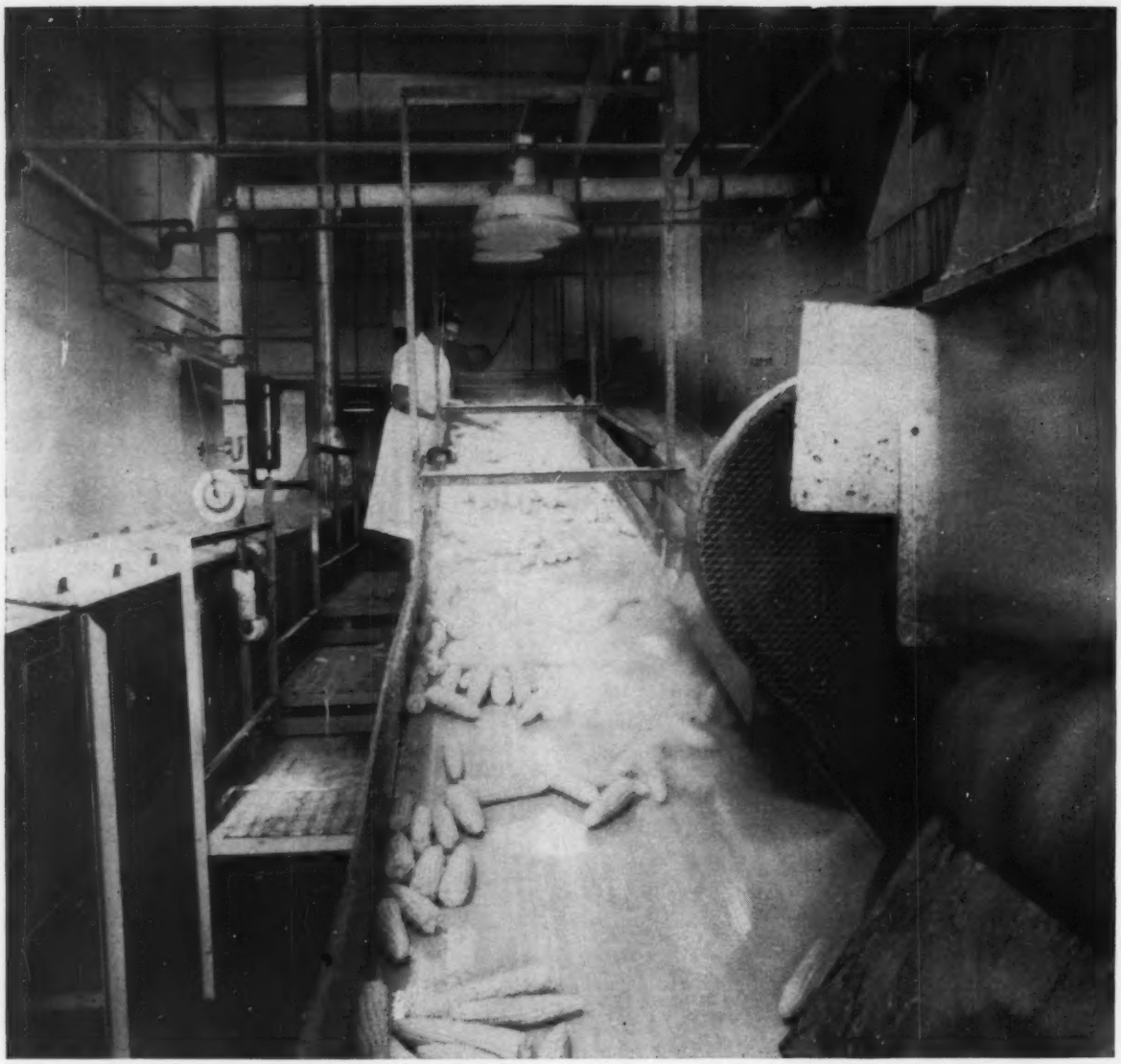

Bacteria belted out of business

B.F.Goodrich "Green Pack" belt resists moisture, mold, fungi

THE fact that the corn is so wet from washing and blanching caused trouble when fabric conveyor belts were used in this cannery. Water soaking into the belts weakened and rotted the fabric. They had to be scrubbed frequently with brushes to prevent the build-up of starch, and the multiplication of bacteria.

Then B.F.Goodrich introduced a new, improved belt, called "Green Pack", developed especially for canneries. It's made with a special rubber compound containing an inhibitor that resists most fungi and molds. It has excellent resistance to moisture absorption—3 times better than regular belts—because all plies of fabric in the belt are treated with BFG's exclusive "Hydroseal" process.

The "Green Pack" belt was tested for bacteria resistance in the cannery's laboratory, then installed in the corn-handling system. It solved the bacteria problem, and at a cost less than the belt it replaced. Since then, nearly a thousand feet of this belt have been added to help speed the processing of 11 million pounds of corn a season.

Because it's so much easier to clean, the cannery also saves 24 manhours a week per belt in scrubbing time. Corn grading is now easier, more accurate, because the gradations in shades of yellow stand out clearly on the belt's light green color.

For more information on the "Green Pack" or any of the conveyor belts developed by B.F.Goodrich for safer, more efficient food-handling, call your BFG distributor or write *B.F.Goodrich Industrial Products Co., Dept. M-963, Akron 18, Ohio.*

B.F.Goodrich

CONVEYOR BELTS

Men & Companies

Sugar Refining Corp., is named marketing v.-p. at Dole Corp.

Hylas E. Smiley is new v.-p. and treasurer of Stouffer Corp.

E. J. Coleman is now national confections marketing manager at Kraft Foods.

Industry

California Packing Corp. plans new "Del Monte" tuna cannery in Mayaguez, Puerto Rico.

Ralston Purina Co. purchased 50% interest in German livestock and poultry feed producer for undisclosed cash sum.

Green Giant Co. approved merger of **Michigan Mushroom Co.** into GG for common stock exchange. Mushroom firm will now be known as Dawn Fresh Co.

Corn Products Co. plans construction of $10 million corn wet-milling plant in Brazil.

Pillsbury Co. announced purchase of 33 acres near Denison, Tex., for construction of refrigerated products plant.

Unilac, Inc., Stamford, Conn., purchased assets of **Cain's Coffee Co.**, Oklahoma City.

Continental Baking Co. entered into agreement to acquire for cash the business and certain assets of Cain's **English Muffin Co.**, Chicago. New unit will be managed by Robert F. Cain, CEM president, as English Muffin bakery of Continental Baking Co.

Frito Co. of Canada acquired production and sales dept. assets of **Sunlite Food Products, Inc.**, Montreal.

Standard Brands has acquired control of Planters Nut & Chocolate Co. after series of complex legal battles.

Associated Industries

W. R. Grace & Co. began operation of new Oversea Chemical Div. plant for manufacture of container sealing compounds at Santa Clara, Mexico.

John J. Ahern becomes board chairman of Rap-In-Wax Co.

Crompton & Knowles Corp. acquired, through stock transfer merger agreement, **F. B. Redington Co.**, manufacturer of automatic cartoning, wrapping, & special packaging machinery.

Milprint, Inc., dedicated new $3 million plant in South San Francisco to consolidate western packaging operations.

Despatch Oven Co. announced introduction of complete line of smokehouse equipment for meat industry.

CHR. HANSEN'S NEW BACTERIOLOGICAL RESEARCH LAB in West Allis, Wis. will be devoted exclusively to practical research and production of food and dairy cultures. Building is to be constructed adjacent to main plant.

Colletta makes possible money saving mechanical labeling on short runs. Works on proven labeling system with full surface gluing and micro-glue adjustment. No glue smearing. Hair line register. Handles stiff glues and synthetic adhesives equally well.

Operation change-over and setting up is simple and fool proof. No special skill needed. Readily converted to fully automatic through use of easily fitted attachments. Changes from one size or shape of container to another take less than 5 minutes. Almost unlimited versatility, up to one gallon size. Send today for complete information. Use coupon.

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Please send us complete information on Colletta Labelers.

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Cookies, crackers, pretzels, dog biscuits, specialty cakes . . . you name it, Werner engineers can deliver the BEST oven to bake it! Even if there's just ONE step in your production that calls for an oven — such as cereals or dry food concentrates — you can bake more efficiently and economically with Werner equipment SPECIFICALLY engineered to do the best job for YOU. And whether your production dictates a 10 ft. or a 200 ft. oven — Werner's Recirculating Heat Band Oven will give you automatically uniform baking efficiency at a savings in both fuel and manpower!

Whatever you bake — find out how you can bake it better and more profitably with efficiency-engineered Werner Equipment.

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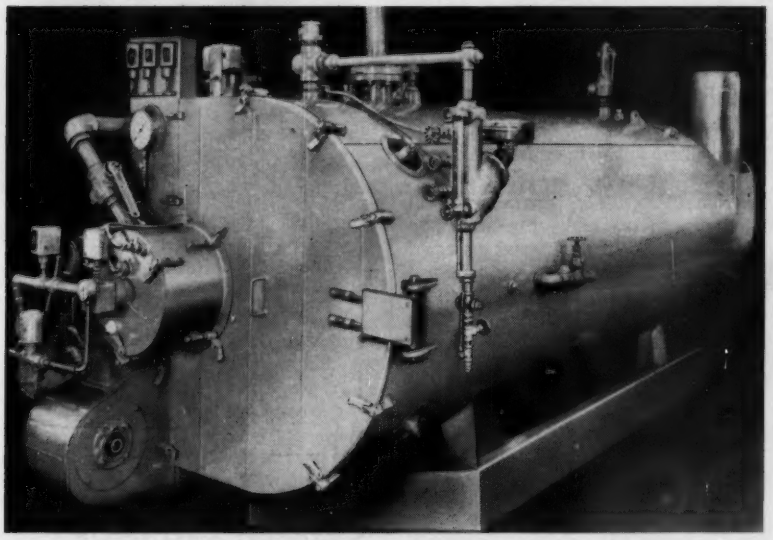
NEW EQUIPMENT & SUPPLIES



ADVANCED DESIGN of combination gas/oil firing boiler provides high operating efficiency, eases maintenance. Unit has 5 sq. ft. of fireside heating surface per bhp., and generates steam with minimum 99.5% quality.

Positive-Flow Boiler Ups Performance

Unusual design of a new line of packaged automatic firetube boilers combines outstanding performance with quiet operation.

Called Powermaster Positive Flow (Model PF), its burner and furnace are on the left side at the horizontal center line. Three pass design, with no tubes directly above or below furnace, avoids any impediment to natural circulation. Boiler-feed injection and natural thermal circulation augment each other for maximum water-circulating rate and the most efficient form of heat transfer—counterflow.

In addition to providing positive circulation, the side located furnace eliminates danger of heat damage due to stagnant water and sludge at bottom of boiler. It enables easy inspection of all fireside and waterside surfaces, permits simple and accessible turn-around spaces, and assures positive sealing.

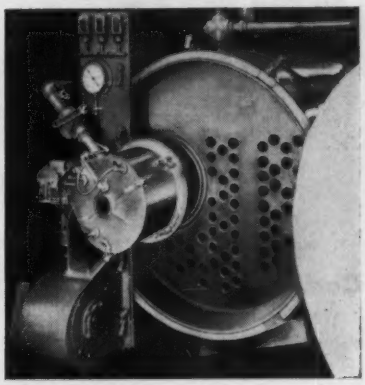
Quiet operation is achieved with a rear-facing inlet near top of boiler and connected through a duct to a blower mounted on the base. Air-supply system, built into front casing of boiler, offers some economy through preheating and gives unit a smooth, easy-to-keep-clean front.

Advanced burner design permits converting from either oil or gas fuel by flipping a switch. Or burner may be operated as a combination unit. This flexibility assures protection of original investment, and enables user to take full advantage of fluctuating fuel prices.

Boiler efficiency on oil is at least 80% and, on gas, up to 80% of optimum efficiency.

Other features of unit:

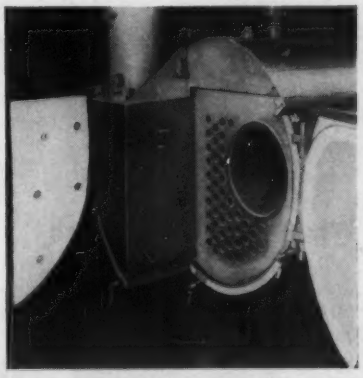
Hinged front cover with quick-opening fasteners. It provides easy access to heating surface in 2 min. without disturbing burner, wiring or piping. No bolts are used.



HINGED FRONT COVER has quick-opening fasteners for easy access to heating surface.

Rear cover is divided for easier accessibility and each section is hinged with quick-opening fasteners. Sections form a separate seal that eliminates short-circuiting of combustion gases and need for internal baffles. Back construction is available with either standard dry-back or optional wetback.

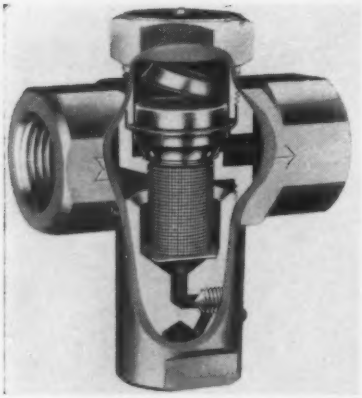
Units are available in five standard sizes: 50, 60, 70, 80, and 100 bhp., and in oil-fired, gas-fired, and



DIVIDED REAR COVER, also hinged, has sections that eliminate short-circuiting of combustion gases.

combination-fired types. Hot water and steam atomization models will also be available in all five sizes.—*Orr & Sembower, Inc., Reading, Pa.*

Circle 251 on Reader Service Card

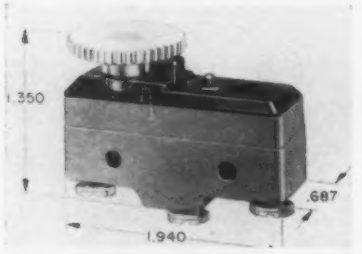


Combination Steam Trap

With strainer and blowdown valve combined in one body, this impulse steam trap is designed for light condensate loads, steam pressures from 8 to 600 psi.

Called No. 130, it requires only two connections. By eliminating separate strainer and blowdown valve and their fittings, it offers installation savings up to 30%, reduces pipe connections by as many as six. Employing the thermodynamic principle, unit operates against back pressures up to 50% of line pressure. It is furnished with ½-in. pipe connections.—*Yarnall-Waring Co., Philadelphia.*

Circle 252 on Reader Service Card



Wheel-Adjusted Switch

Turning the knurled wheel on top of this switch adjusts its differential travel from 0.0025 to 0.007 in. Unit is termed especially suited for precision devices such as pressure controls.

Designated 10BS210, it offers a mechanical life of over 5 million operations. Changing the differential travel changes the contact break distance, the pre-travel distance, and operating and differential forces. Operating force ranges 12-32 oz., the differential force 2-15 oz. Release force, however, remains at 10 oz. regardless of the differential setting.

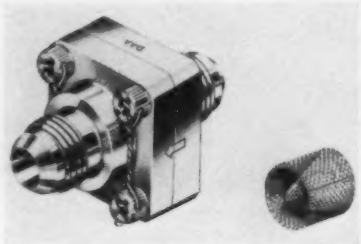
Switch is rated at 20 amp. at 120, 250, or 460v. a.c.; ¾ hp. at 115v. a.c.; 1½ hp. at 230v. a.c.—*Minneapolis - Honeywell Regulator Co., Freeport, Ill.*

Circle 253 on Reader Service Card

Miniature In-Line Filter

Lightweight and compact, this filter offers universal, in-line applications wherever caustic and/or corrosive liquids or gases are handled. It withstands pressures to 2,250 psi., temperature extremes of —350F. to 500F.

Unit is 1⅛ in. square and about 2 in. long. Except for a Teflon



washer that seals the two body halves, it is entirely of stainless steel. Filter element is a woven, wire mesh screen. Its cylindrical shaped cup with cone bottom offers maximum flow and provides 1.2 sq. in. of filter surface.

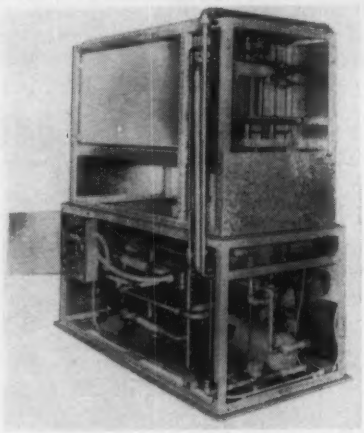
Filter is available in standard sizes to fit ¼ and ⅜ in. tubing, but other sizes can be provided. —*Dumont Engineering Corp., Long Beach, Calif.*

Circle 254 on Reader Service Card

Cracked-Ice Maker

This machine produces cracked ice of the type reportedly most practical and economical for food processors. It is non-uniform in shape, averages ⅝-1½ in. x ⅝ in. thick, and weighs about 36 lb. per cu. ft.

In operation, ice is formed in sheets about ⅝ in. thick and drops into a crusher at bottom of unit. Freeing cycle is 20-40 min., and water used for defrosting is automatically pre-cooled for next cycle. Unit operates in any above-freezing location, requires no refrigerant seals, uses no moving parts in freez-



ing and harvesting of ice, and is rust-free.

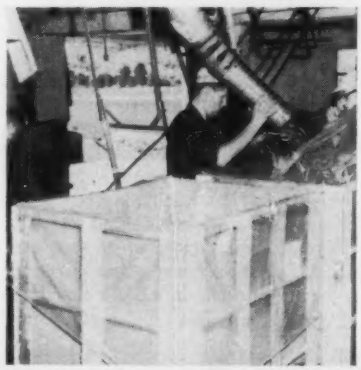
Controls consists of relay, solenoid and timer. Machines are available in 1-200 ton (per 24 hr.), single or multiple units, and for use with ammonia or Freon. A 30-ton unit requires 8x9x8 ft. of space. —*Chicago Stock Yards Turbo Refrigerating Co., Chicago.*

Circle 255 on Reader Service Card

Container Cuts Costs

Lower-cost handling, storing, and shipping of frozen foods is reported for this unique bulk container. Seabrook Farms Co. has used several thousand of the 22.6-bu. units.

A wirebound wooden 'blank' forms the four sides of the con-



tainer and serves most functions of a pallet. This permits use of an inexpensive bottom and 125-lb.-test corrugated lining. Product is kept free of contamination inside a large polyethylene bag. Reusable

(Turn to Page 103)

Do You Use

ONION AND GARLIC?

Then You'll Want To Try the Two New D&O Products

DOLCOSEAL ONION AND DOLCOSEAL GARLIC

These Advantages

FRESH OIL FLAVOR

INSTANT SOLUBILITY

NON-HYGROSCOPIC

DOLCOSEAL ONION AND GARLIC are spray-dried products made from pure, natural oil, of a quality available only from D&O. Equal in flavor strength to dehydrated onion and garlic, their stability and storage life far exceed that of the former. They are instantly soluble in water, yielding a crystal clear solution and non-hygroscopic (will not cake in storage or ball up in a slurry.) The flavor and aroma are that of natural onion and garlic, and are instantly available, requiring no time for leaching out. In most applications, starting recommendations call for the use of one pound of DOLCOSEAL ONION or GARLIC to replace one pound of dehydrated material. Write today, or contact your D&O representative for trial quantities!

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ESSENTIAL OILS • AROMATIC CHEMICALS • FLAVOR BASES • DRY FLAVORING MATERIALS

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HERCULES

"BEEF-UP" YOUR REPEAT SALES WITH HVP-CENTURY

The initial sale is important but volume is built on repeats. That's why so many food processors are including Hercules HVP®-Century powdered in their formulations for the flavor of well-browned beef. It's a flavor that brings satisfied customers back to the counter again for "seconds."

HVP-Century, a total hydrolyzed vegetable protein derived from wheat protein, contains 100% of all the amino acids derived from the hydrolysis with none of the monosodium glutamate removed.

The latest addition to Hercules' full life of HVP powder and liquids and MSG, HVP-Century offers many possibilities for cost savings and processing advantages.

A four-page data sheet is available to provide complete specifications on HVP-Century as well as information on how to compute cost savings and convert formulations. A data sheet and a sample of HVP-Century, which has FDA acceptance for use in many applications, can be obtained by writing:

Huron Milling Division, Virginia Cellulose Department

HERCULES POWDER COMPANY

INCORPORATED

Hercules Tower, 910 Market Street, Wilmington 99, Delaware

container is high-stacking and has a 4-way pallet base.

Wooden members of the blank are reinforced by steel wires that add strength and facilitate rapid assembly. Bottom row of horizontal wooden cleats on the blank supports the slatted wooden base. Tare weight of package is 55 lb. — *Indianapolis Wire Bound Box Co., Fernwood, Miss.*

Circle 256 on Reader Service Card

Eases Floor Cleaning

Powered by LP gas, this floor cleaner offers mobility of gasoline models without objectionable fumes.

Known as Floormobile, it handles up to 20,000 sq. ft. per hr. Powerful suction cleans dust, dirt, and trash off the floor into an easily emptied can. A special filter enables cleaning without whipping up dust.

Easily maneuverable unit cleans a path 22 in. wide, yet is only 23 in. wide.—*Handling Devices Co., Cambridge, Mass.*

Circle 257 on Reader Service Card

Records Temperature Of Foods in Transit

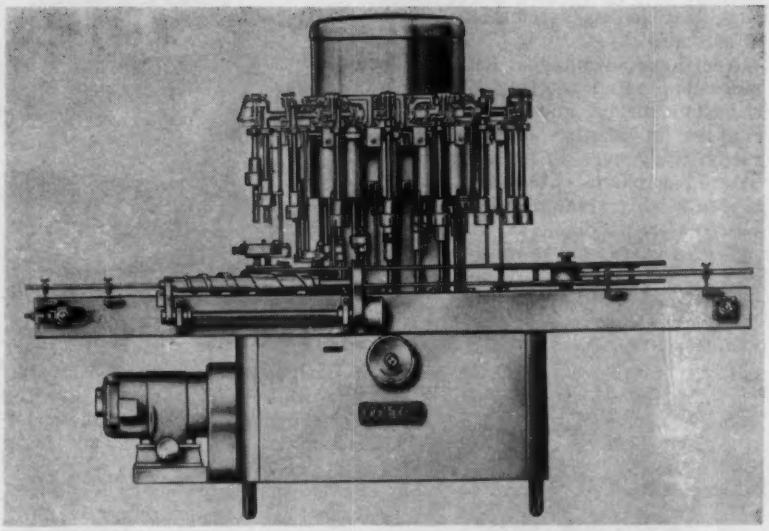
Greater protection for frozen foods and perishables in transit is offered by this recording thermometer through faster response to temperature fluctuations and improved accuracy.

Called Model D, it has an extended range of −20 to 100F.—particularly significant for checking compliance with zero-in-transit standards of the AFDOUS Code. Unit is 3-in. dia. and 5 in. long. Continuous hour-by-hour temperature record can be made for periods

of 15 or 30 days. A convenient metal bracket enables placing the thermometer at any desired location in the load.—*Ryan Recording Thermometer Co., Seattle.*

Circle 259 on Reader Service Card

FE Annual Editorial Index available upon request at 35¢ per copy



Rotary Filler Handles 320 Containers Per Min.

Four efficiency features are cited for this new 16-station rotary filler: (1) A low-speed, large-diameter discharge star wheel that reduces whip forces on filled container, (2) individual nozzle tip shutoffs, (3) vernier fill adjustment for each station, and (4) infinitely variable platform-rise adjustment up to 8 in. for bottom-up filling.

Known as Model No. 16, volumetric unit fills containers from 1½-4 in. dia. and up to 10 in. high at rates of 110-320 per min. Fill is adjustable from ¾-32 fl. oz. In operation, containers are picked up from a straight-line conveyor by a timing screw and placed one-at-a time in an eight-pocket star wheel infeed that deposits a container under a filling nozzle. Conveyor system is stainless steel.

Of sanitary design, unit has a 35-gal. stainless hopper and 'no-container—no-fill' feature. It takes floor space of about 130x74 in., is 75 in. high. —*Arthur Colton Co., Detroit.*

Circle 258 on Reader Service Card

Particle-Size Analyzer

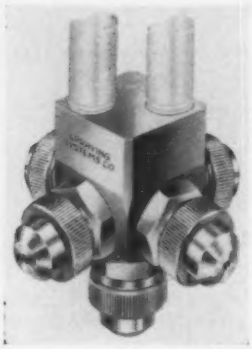
Simplified rapid particle-size determination with high reproducibility is offered by this unit.

Known as Model "C", its particle range extends from below 1 micron to above 200 microns. Providing either multiple-channel readout, printout, or mass percent graphout automatically, unit produces com-

plete particle-size distribution data in seconds.

Additional advantages: Less data reduction, rapid plotting of distribution curves, and particle-size changes in relation to time for ready study over full size range. Magnified narrow-size-range data is also readily obtainable.—*Coulter Electronics, Chicago.*

Circle 260 on Reader Service Card



Cleans Tanks Efficiently

Special design of this five-nozzle pneumatic atomizer offers highly effective fogging for cleaning of tank interiors.

Called No. 8650, unit is available in a variety of air and fluid nozzle setups for capacities ranging 1-200 gph. Extremely fine atomization is obtained even at low air and water pressures of 20 psi. Nozzles produce a round spray, wide angle round spray, or flat spray.

Assemblies are offered in nickel-plated brass and stainless steel.—*Spraying Systems Co., Bellwood, Ill.*

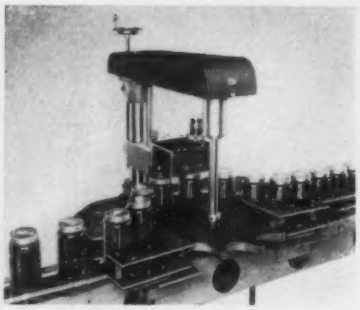
Circle 261 on Reader Service Card

Detects Smoke Hazard

An 'electric eye' unit that guards against smoke circulated by an air-conditioning system can avert property damage or loss of life due to fire.

Smoke may enter an area from an outside source — recirculated from fire in other parts of a system, or from spontaneous combustion in filters. However, with this alarm, unit stops the fan and flashes a red danger signal at any predetermined volume of light cut-off. An audible alert signal may be added. System is made by *Photomation, Inc., Bergenfield, N. J.*

Circle 262 on Reader Service Card



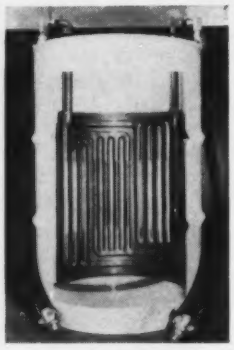
Marks Cans, Jar Tops

Designed to overhang a conveyor line, this unit automatically imprints prices, codes, etc. on top of cans, jars, and bottles at speeds to 600 per min.

Designated Model TT "Markcoder," it does not require cutting the line nor using dead plates. Imprints are spotted in same location on each succeeding product regardless of whether flow is constant or irregular. In addition, unit automatically compensates for slight variations in product height, and imprints surfaces recessed as much as ⅝ in.

A variation of the basic model imprints top and bottom of container at same time.—*Adolph Gottscho, Inc., Hillside, N. J.*

Circle 263 on Reader Service Card



Fast-Acting Drum Warmer

Rapid heating of products in 55-gal. is offered by this immersion-type heater.

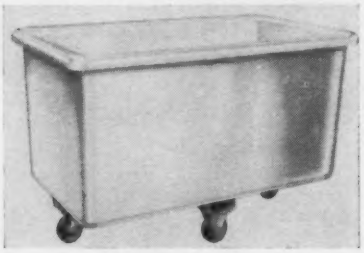
Unit consists of a special heat-transfer coil rolled to proper diameter to fit contour of drum wall. Available in either serpentine or header construction, its inlet and outlet connections are outside of the drum. Standard size is 22x29 in. mild steel. —*Tranter Mfg. Inc., Lansing, Mich.*

Circle 264 on Reader Service Card

Plastic Box Truck

For efficient bulk handling of dry or liquid materials, this lightweight fiberglass box truck is watertight and resists corrosion by water, oil, and mild acids.

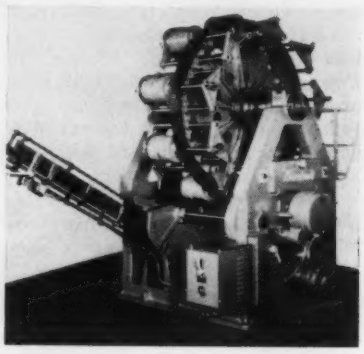
Inside surface is smooth and its rounded corners prevent dust accumulation. Nesting units with-



stand steam cleaning and operating temperatures of −40 to 212F.

Three sizes 16-21 cu. ft. are offered. Tilt-mounted or level-mounted swivel and rigid casters are supplied in 4 or 5 in. replaceable rubber-tired or cushion tread solid rubber wheels. — *Hamilton Caster Mfg. Co., Hamilton Ohio.*

Circle 265 on Reader Service Card



High-Speed Can Tester

This 9-pocket unit leak-tests tin cans and pails up to 2½ gal. at speeds of 50-100 per min.

For greater efficiency, the mechanical-loading tester offers: Improved test pockets for quicker changeover for cans of various size and shape; increased test cycle period for leak detection; a sensitive switch that eliminates problems of atmospheric interference; and an improved discharge turret that curbs mechanical failures and provides positive discharge of defective cans while operating at high speeds.—*Borden Co., Can Machinery Div., New York City.*

Circle 266 on Reader Service Card

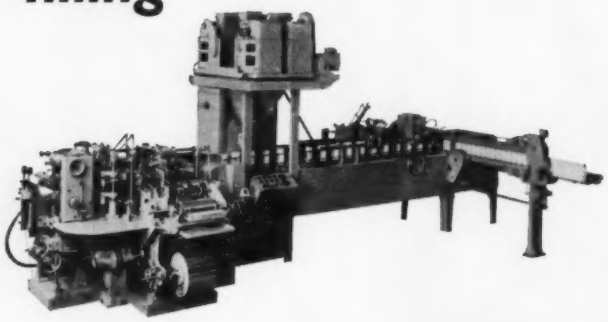
flavor by Webb

Rich, ripe pineapple is one of the superb synthetic flavors perfected by Webb. It is available in several liquid versions and in spray-dried form to suit all applications. For samples and usage information to meet your specific requirements, please call or write Webb. Food flavor specialists for over 50 years.

R. D. WEBB & CO., INC.

STIMPSON AVENUE AND STILES STREET, LINDEN, NEW JERSEY

Get fast accurate filling with SIG* Double-Package Makers



If you package dessert powders, cut macaroni products, cereals, dried vegetables, etc. in folding cartons with inner-liners or overwraps, investigate SIG line Double-Package Makers. You will discover this world-famous line can improve your packaging and substantially reduce your costs. Here are some of the advantages you'll get:

Top Speeds–Makes, fills and seals up to 80 packages per minute from approximately 3 oz. to 5 lbs.

Versatile–Models to handle almost any free-flowing or non free-flowing powder or granular product with choice of three filling methods–net weight, volumetric, gross weight with auger feed.

Air-Tight Package – Inner bag formed on exclusive twelve-mandrel system for continuous, unbroken vertical seals . . . and closed independently of carton by heat sealing, glue or with neat, accordion style top fold for easy reclosing. Handles paper, glassine, Pliofilm, cellophane or laminated materials from roll stock. Cartons with glued flaps or tuck-lids formed and sealed from flat blanks. Overwraps from roll stock registered photo-electrically.

Dependable – All models are exceptionally high efficiency, low maintenance machines . . . proven in modern food plants the world over.

**SIG is the trademark of Swiss Industrial Company, Switzerland . . . for over five decades a world leader in precision engineered packaging machines built with unsurpassed skill.*

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←CIRCLE 105 ON READER SERVICE CARD

CIRCLE 106 ON READER SERVICE CARD

Plant Sanitation & Maintenance

Unique Floor Conditioner Is Easily Applied

Now solving floor maintenance and repair problems—especially in dairy and food processing rooms—is a new floor conditioner.

Product (Emeri-Epox) eliminates erosion and slipperyness due to lactic acid conditions commonly found in dairies. Unaffected by steam cleaning, freezing temperatures, petroleum products, and chemicals, finish, is hard, durable, easily cleaned.

It is easily spread in ⅛-¼ in. thicknesses over thoroughly cleaned concrete, brick, tile, stone, wood, and metal surfaces. Ready to use from convenient drums or pails, product is also available in colors. —*Creamery Package Mfg. Co., Chicago.*

Circle 267 on Reader Service Card

Sanitary Conveyor Chain Needs No Lubrication

Seen easing sanitation and cutting maintenance is a new conveyor chain made of Delrin, an acetate resin.

Called Table Top, it resists corrosion by brines, most acids and alkalis. Chain retains original strength and dimensions in either wet or dry service, and its low coefficient of friction eliminates need for any lubrication. It can be used at temperatures ranging —20 to 180F., and does not scratch or damage containers. — *Chain Belt Co., Milwaukee.*

Circle 268 on Reader Service Card

Edible Lubricant

Impressive advantages are cited for a white, buttery-textured lubricant that is actually edible.

Called #175 Multi-Purpose, it is credited with virtual elimination of bearing wear, longer service life at considerably lower use level, and less application labor. Moreover, it offers complete protection against inadvertent product contamination.

Lubricant's superior properties are attributed to high acid and heat resistance, smooth texture, purity, and proper weight for resisting 'washout and pound-out'.—*Lubrication Engineers, Inc., Fort Worth, Tex.*

Circle 269 on Reader Service Card

Easier-to-Use Cleaner

Supplied for user convenience in self-dissolving, pre-measured packs, a chlorinated equipment cleaner offers powerful cleansing and brightening action, effective water conditioning, and thorough rinsing.

Called Diomite, product is packaged in 1-oz. and 4-oz. units (Iso-Paks) that assure accurate solution strength and eliminate guesswork, waste, and spills. The unopened package is dropped into hot water and begins to dissolve instantly. Material is particularly recommended for manual cleaning of piping and processing equipment.—*Diversey Corp., Chicago.*

Circle 270 on Reader Service Card

Safety Glasses, in six colors, are designed for greater safety and attractively styled so workers will wear them more willingly on the job.—American Optical Co., Southbridge, Mass.

Circle 271 on Reader Service Card

Colorless Floor Sealant hardens and dustproofs any concrete surface in food plants. Known as Pliocon, it is easily applied and resists water, oil, and acids. — Monroe Co., Cleveland.

Circle 272 on Reader Service Card

OPEN-MESH DESIGN

LA PORTE FLEXIBLE STEEL CONVEYOR BELTS

The LaPorte flexible, open-mesh feature permits the circulation of air and liquids around products in process, reduces freezing, cooking and dehydrating time and speeds up drainage in washers and scalders. Also facilitates sterilizing with a steam gun while in motion. In addition, it assures a positive drive on the LaPorte sprocket on both stationary and portable conveyors, and prevents products from rolling off.

Ideally adapted to filling tables, LaPorte Flexible Steel Belts provide a perfectly flat surface for all types of containers, empty or filled, as well as shipping cartons.

If you freeze, can, dehydrate, pickle, package, store or ship food, it will pay you to use La Porte belts. Available in ½" x 1", or 1" x 1" in any length and practically any width. Ask your mill supplier or mail coupon for illustrated literature and prices.

MAIL COUPON TODAY

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Please send free literature on your Conveyor Belt.

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Food Ingredients & Additives

Tapioca-Base Product Ups Dessert-Mix Quality

Three important ingredient functions are provided by a carbohydrate based on tapioca and developed specifically for controlled-calorie dietetic mixes.

Combining moderate thickening power with minimum gel action, product (Residol D-C): (1) Stabilizes the flavor, fat, and solid components of the mix to prevent undesirable separation; (2) thickens the mix to give a feeling of appetite appeasement; and (3) as a nutrient, provides some 345 calories per 100 gm.

The carbohydrate conforms with FDA requirements and is easily assimilated, digested, and metabolized. It yields a translucent aqueous dispersion without heating and is instantly soluble even in very cold milk. Furthermore, its blandness eliminates masking of flavors, which minimizes the amount of flavoring required. Granules are sized for quick dispersibility: 100% through 50 mesh. — *Morningstar-Paisley, Inc., New York City.*

Circle 273 on Reader Service Card

High-Purity Gum Arabic

Now available in commercial quantities is a high-purity gum arabic said to exceed U.S.P. standards on all counts.

Spray-dried to half the conventional moisture content, product (Arabasan) is a white powder that is virtually colorless in solution. Moreover, it is almost completely free of sediment, impurities, and bacteria.—*Tetroid Co., Hamilton, N. Y.*

Circle 274 on Reader Service Card

Potent Cellulase Enzyme Has Many Applications

Cellulosic materials, such as grape pumace and soybean hulls, may be rapidly and efficiently digested by a new cellulose enzyme preparation.

Known as Cellulase 400, it offers excellent stability and activity under an unusually wide range of conditions. Action of the enzyme is to hydrolyze and depolymerize cellulosic materials.

Current research indicates these additional applications:

1. Brewing—increases body of finished beers.
2. Citrus juices—clarifies the juice and increases yields.
3. Essential oils—aids in extraction of essential oils and other natural flavors by breaking down plant cell walls.
4. Septic systems and drain cleaner—destroy paper and other wastes.

Solutions of the enzyme at its natural pH of 5.0 are indefinitely stable at temperatures up to 100F., or even higher. Cellulase activity is termed excellent over a broad pH range, the maximum occurring at pH 3.0-3.5.—*Miles Chemical Co., Elkhart, Ind.*

Circle 275 on Reader Service Card

Meat Tenderizer Ok'd

According to a recent MID ruling, the meat-tenderizing enzyme, Rhozyme P-11, may be used for treating meat cuts. It is said to contribute economical tenderizing action while minimizing mushiness and off-flavor.

Since this type of enzyme is not considered an additive within the meaning of the Food Additives Amendment of 1958, it is not necessary to obtain an FDA regulation specifically approving its use.

However, such enzyme use in federally inspected plants is subject to regulations concerning proper labeling. A prominent descriptive statement of the tenderizing treatment must appear on the product label. Moreover, meat's gain in weight as a result of tenderizing is limited to 3%.—*Rohm & Haas Co., Philadelphia.*

Circle 276 on Reader Service Card

NIAGARA "no frost"

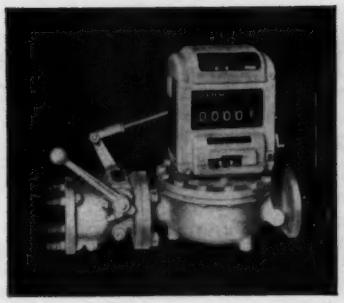
● Saving labor in both operation and upkeep, "No-Frost" fully automatic refrigeration gives you always the full rated capacity of your plant. You get all the benefits of continuous production and your business makes money on lower volume. Preventing all ice or frost accumulation, "No-Frost" prevents waste of power. You cut out much expensive maintenance labor in the cold room. Your production and your quality both improve because "No-Frost" pulls the product core temperature down the quickest and holds it uniformly.

Write for Bulletin No. 105

NIAGARA BLOWER COMPANY

Dept. FE-2, 405 Lexington Ave., New York 17, N. Y.

District Engineers in Principal Cities



Repeating Auto-Stop Meter Handles Same-Size Batches

Neptune Repeating Auto-Stop industrial meter delivers same quantity of liquid each time valve is opened, shutting off automatically when preset quantity is reached. Quantity setting may be changed by simply pressing Auto-Stop buttons.

This new meter offers several advantages:

Better quality control: Chance of human error is greatly reduced, since the Auto-Stop setting is made only once, regardless of number of batches that are needed.

Less operator time needed: Since the meter automatically delivers the same correct quantity, time after time, the operator can attend to other work during metering cycles.

Greater flexibility: When a batch size or formula changes, only a few seconds are needed to press the Auto-Stop buttons to change the meter to a new quantity .

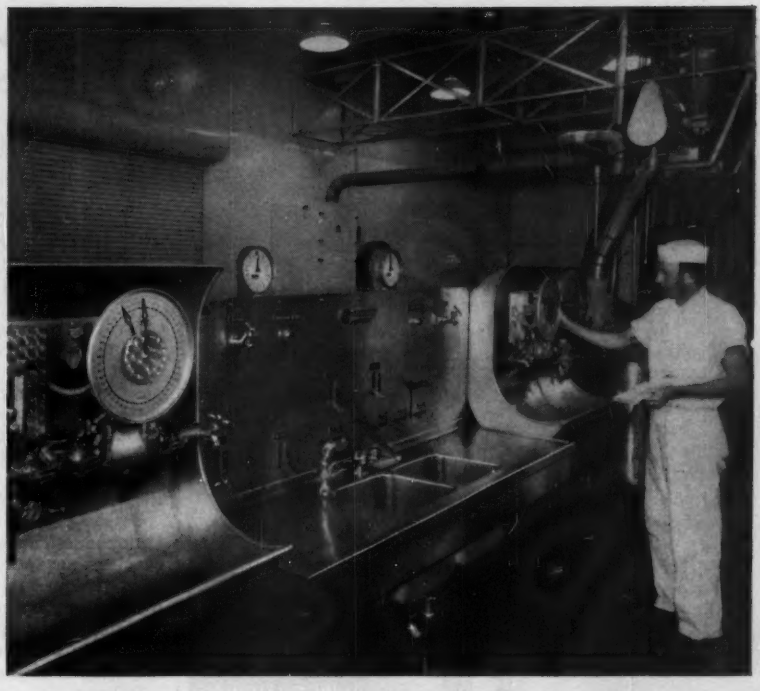
Flow can be stopped at any point in the cycle by pressing the Emergency Stop button. Available in 1-, 1½-, 2- and 3-in. sizes, for rates of flow up to 150 gpm.

Free Neptune Bulletin 566 Tells The Whole Story Of Industrial Meter Selection

Bulletin 566 has been completely revised, to make it even easier for the engineer to select the *best* meter-register combination for any industrial liquid metering job that can be handled by composition bronze meters.

Subjects covered include: List of liquids that can be handled; construction details; register types; sizes of meters; accessories; installation directions; and numerous application photographs. Heavily illustrated with 28 pages of vital facts for the processing industries.

To learn how meters can save labor, materials, and time, with closer quality control, and more accurate cost accounting, send for your *free copy* of Bulletin 566.



How Langendorf Bakeries SAVE WEIGH, WAIT and DOUGH with NEPTUNE *liquid* METERS

Taste-perfect baked goods and low cost operation depend on getting exactly the right amount of each ingredient into the mix with minimum handling. That's what these four Neptune meters are doing for Langendorf United Bakeries, Inc....saving materials, time, labor...eliminating the hauling of bags and buckets. Liquid sugar, hot shortening and water are all moved and measured "in the pipe". Accurate *metered* measurement keeps the profits in production, and uniform flavor in the goods.

Savings in time and ingredients can be made in *your* plant by adding Neptune meters wherever liquids are batched, blended or transferred. Tell us what you want meters to do and we'll gladly give you recommendations.

GET THE FACTS

Ask for helpful Meter Data Bulletin 566 CF. See Neptune Data Pages in Chemical Engineering Catalog.

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LIQUID METER DIVISION
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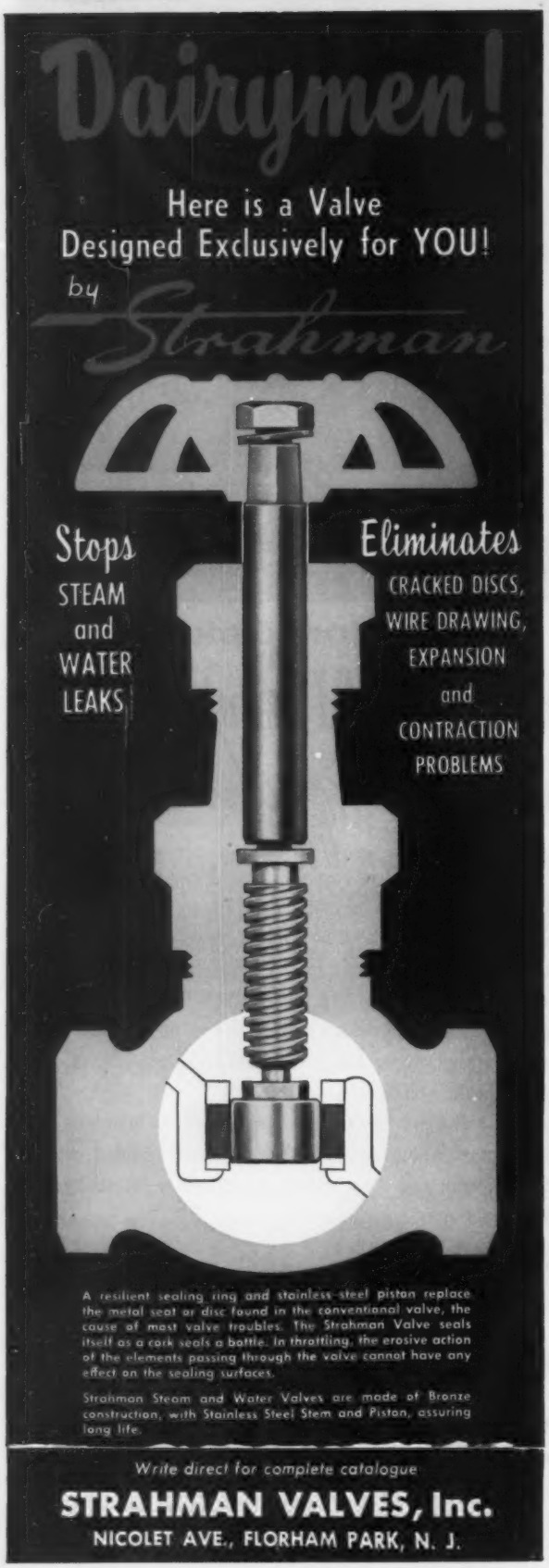
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Designed Exclusively for YOU!
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STEAM
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WATER
LEAKS
Eliminates
CRACKED DISCS,
WIRE DRAWING,
EXPANSION
and
CONTRACTION
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A resilient sealing ring and stainless steel piston replace the metal seat or disc found in the conventional valve, the cause of most valve troubles. The Strahman Valve seals itself as a cork seals a bottle. In throttling, the erosive action of the elements passing through the valve cannot have any effect on the sealing surfaces.
Strahman Steam and Water Valves are made of Bronze construction, with Stainless Steel Stem and Piston, assuring long life.
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Just Off the Press

PACKAGING

Fibre Cans. Details raw materials and manufacturing processes of product, with present and potential applications. 35p. — Sefton Fibre Can Co., NYC. (326)

Glass Fibre. Describes resilient padding fabricated of glass fibres held with plastic resin, giving applications of formed sections with specifications and compression data. 4p.—Fibrous Glass Products, Inc., Hicksville, N. Y. (327)

Cellophane Tapes. Presents concise description of types most frequently used, including properties and principal applications. 4p.—E. I. du Pont de Nemours & Co., Wilmington, Del. (328)

Polymer-Coated Films. Details advantages over conventional lacquer - coated cellophane types. 4p.—American Viscose Corp., Philadelphia. (329)

INGREDIENTS

Baking Flavors. Describes applications of instant, natural fermentation types with specs and formulations. 10p. — Vico Products Co., Chicago. (351)

Polyphosphate. Catalog sheet details features for increased binding power in processing of meat, blended sausages, and canned meat. Benckiser, Inc., Ridgefield, N. J. (352)

Citric Acid. Lists grades of types available with physical and chemical properties and applications. 30p.—Miles Chemical Co., Elkhart, Ind. (353)

MATERIALS HANDLING

Lift Trucks. Pictorially describes versatile uses in variety of industries. 12p.—Automatic Transportation Co., Chicago. (357)

Conveying Equipment. Catalogs firm's line with special emphasis on new products and techniques. 44p.—Rapids-Standard Co., Inc., Grand Rapids, Mich. (358)

Materials Handling Systems. New Handbook illustrates new ideas for retailers, manufacturers, wholesalers and service industries. 43p.—Rapids Standard Co., Grand Rapids, Mich. (365)

PROCESSING

Sifter. Outlines major points in unit selection, basic operating principles, screening aids, and mesh size specs. 4p. — Sprout Waldron & Co., Muncy, Pa. (334)

Attrition Mills. Includes illustrations and specs of single and double runner units. 8p.—Young Machinery Co., Inc., Muncy, Pa. (335)

Magnetic Grates. Illustrates models available including case histories on use of various types. 6p.—Eriez Manufacturing Co., Erie, Pa. (336)

Mixers. Introduces "building block" models featuring component interchange. Cleveland Mixer Co., Bedford, Ohio. (337)

Press Aids. Describes four basic fiber types and advantages in juice manufacture. 12p. — Weyerhauser Co., Tacoma, Wash. (338)

SANITATION & MAINTENANCE

Solution Control. Describes automatic unit for controlling strength of bottle-washing solutions. The Diversey Corp., Chicago. (341)

Mastic Flooring. Details economical, dustless, jointless, resilient, waterproof, corrosion resistant surfacing. Ralph V. Rulon, Inc., Philadelphia. (342)

Oxy-Catalyst Purifier. Gives case histories showing different applications of this fume reducing device.

4p. — Oxy - Catalyst, Inc., Berwyn, Pa. (343)

Heavy Duty Detergent. Introduces alkaline cleaner designed for rugged jobs. 2p.—Oakite Products, Inc., NYC. (344)

INSTRUMENTS

Transmitting Rotometer. Describes new through-flow pneumatic unit which eliminates extension and changes in fluid flow direction when mounted alongside metering tube. 6p.—Fischer & Porter Co., Warminster, Pa. (385)

Flow Control. Illustrates automatic pre - determined counter that provides push button control of fluid measuring, batching, mixing, or blending. 4p.—Potter Aeronautical Corp., Rt. #22, Union, N. J. (Request on company letterhead)

Pressure Transmitter. Details unit for pressure measurement of steam, liquid, and gases in pipes and pressure vessels. 2p. — Bailey Meter Co., Cleveland, O. (387)

MANAGEMENT

Save On Sanitation. Gives well - organized procedures for controlling housekeeping supply inventory. Practical methods for inventory control are outlined in detail and geared to save you money in this area. Includes information on inventory levels; re-orders; storage of supplies; waste prevental; storing, marking, and color coding supplies; and coordination between maintenance dept. and purchasing, including case histories. 4p.—Puritan Chemical Co., Atlanta, Ga. (395)

Employee Research. Describes firm's services in evaluation of employee attitudes. Explains significance of over 100 studies conducted in this area and outlines the emphasis, objectives, and techniques of the research. Further details how such studies can be applied to your firm for more effective management and less apathy among em-

(Continued on Page 113)

Rheology / Viscosity

Does the quality or cost of your product depend on its flow characteristics?

► A complete line of Epprecht Viscometers provide viscosity measurements in the laboratory or during processing with automatic control of viscosity.

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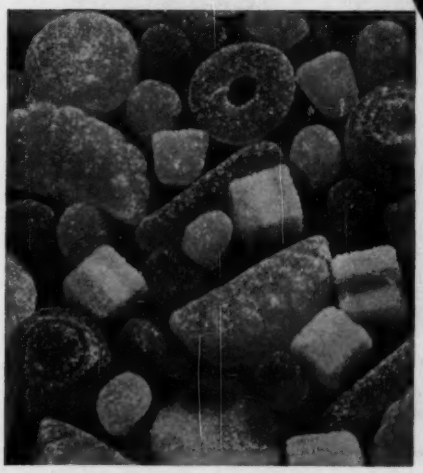
CIRCLE 127 ON READER SERVICE CARD

CONFECTO-JEL
Especially made for Jellied Candies



better product consistency and quality for over 40 years

SPEAS
APPLE PECTINS

- Adaptable to wide range of PH levels.
- Neutral color and flavor—blends naturally with more different fruits than any other pectin.
- Gives product resiliency to avoid breakage during shipping.
- Improves spreadability of jams, jellies and preserves.
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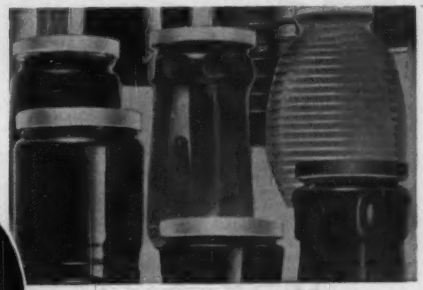
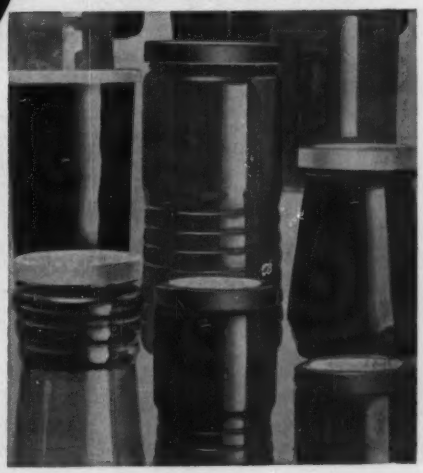
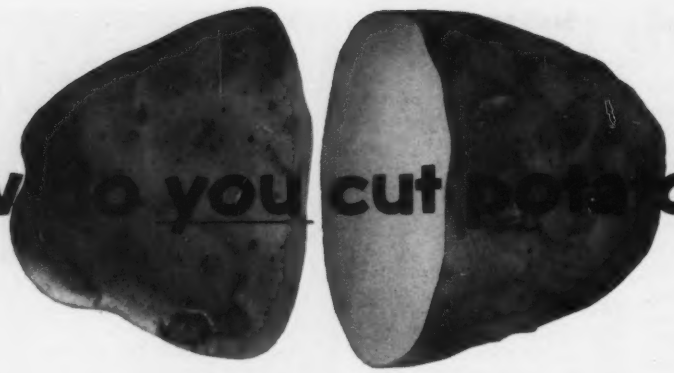


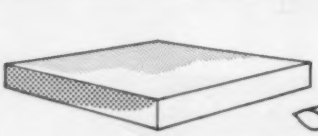
NUTRL-JEL
Regular and Slow Set
For Finest Jams, Jellies and Preserves



how do you cut potatoes ?

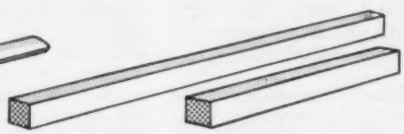


New potato shapes, created to *revitalize* lagging appetites, are making important sales news all along the nation's shopping fronts. Urschel machines can cut practically any shape you want. They feature precision uniformity, highest yields, lowest product loss, unusually high capacities, low maintenance, and complete product protection (product contacts only stainless steel or special non-corroding metal surfaces).



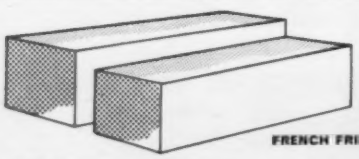
HASH BROWN POTATOES
3/16" x 1" x 1"

SHREDS FOR POTATO PATTIES
1/4" wide and 3/16" wide



SHOE STRING POTATOES
5/32" square cross section

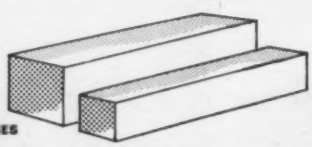
SHOE STRIPS CUT TO LENGTH
5/32" square x 1-1/4"



FRENCH FRIES

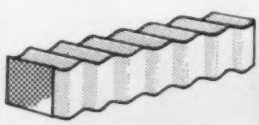
1/2" square cross section

7/16" square cross section

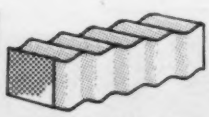


3/8" square cross section

1/4" square cross section



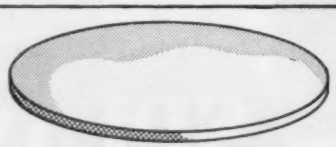
CORRUGATED FRENCH FRIES
9/16" square cross section



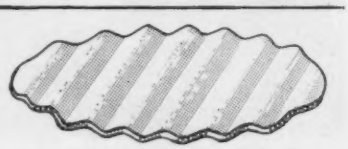
CORRUGATED FRENCH FRIES CUT TO LENGTH
approx. 1" lengths

AMERICAN FRIES
3/16" thickness

GERMAN POTATO SALAD
3/16" thickness



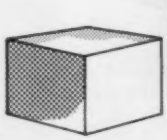
FLAT POTATO CHIPS
1/16" thickness



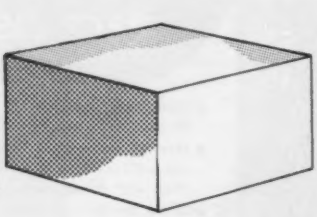
CORRUGATED POTATO CHIPS
1/16" thickness

POTATO PATTY PIECES FROM FRENCH FRY SCRAP
1/8" x 1/4" x 1/4"

SOUP CUTS
3/8" cubes



POTATO SALAD
1/2" cubes



STEW CUTS
3/4" x 1" x 1"

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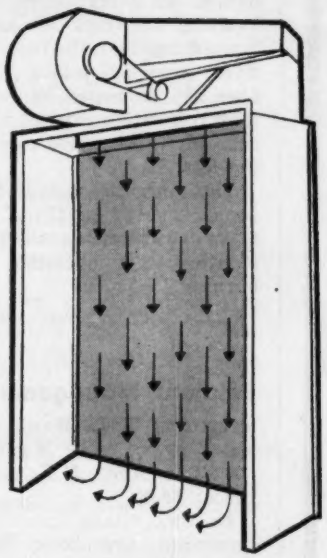
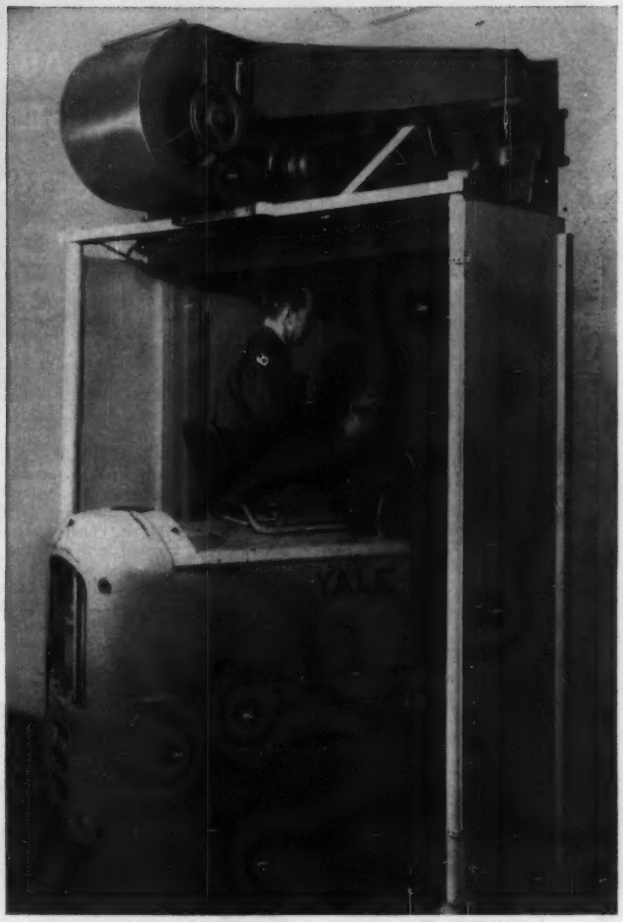
***opens** doorways to unlimited traffic*



Air Isolator is available for openings up to 8′ wide, 10′ high.



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***screens out** heat, cold, humidity, dust, odors, insects*

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EFFECTIVE WORK MANAGEMENT *by Milon Brown, The Macmillan Co., 60 Fifth Ave., N.Y.C. 11. 1960. Price: $5.00.*

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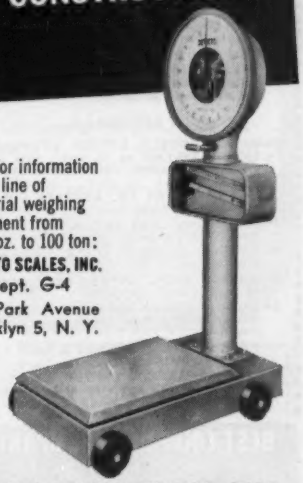

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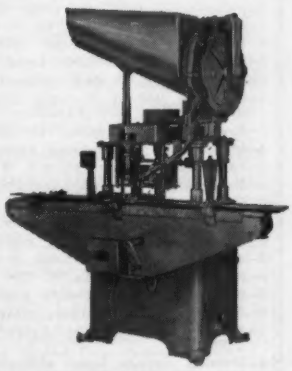

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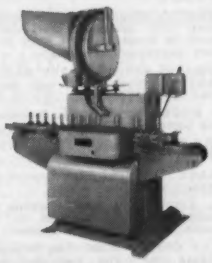

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Sharper Additive Check, June 1960.

Weighing Makes Big Strides by John V. Ziemba, March 1960.

Broad-Gage Supervisor Training Boosts Selling 5 Ways by T. C. Taylor, September 1958.

Selling Approach: Key to Winning Shelf Space in the Chains by C. R. Havighorst, March 1958.

Putting the Sweet Smell of Success into Sales Promotions by Jerry Keefe, January 1960.

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How to Build Facts into Profits by Thayer C. Taylor, March 1960.

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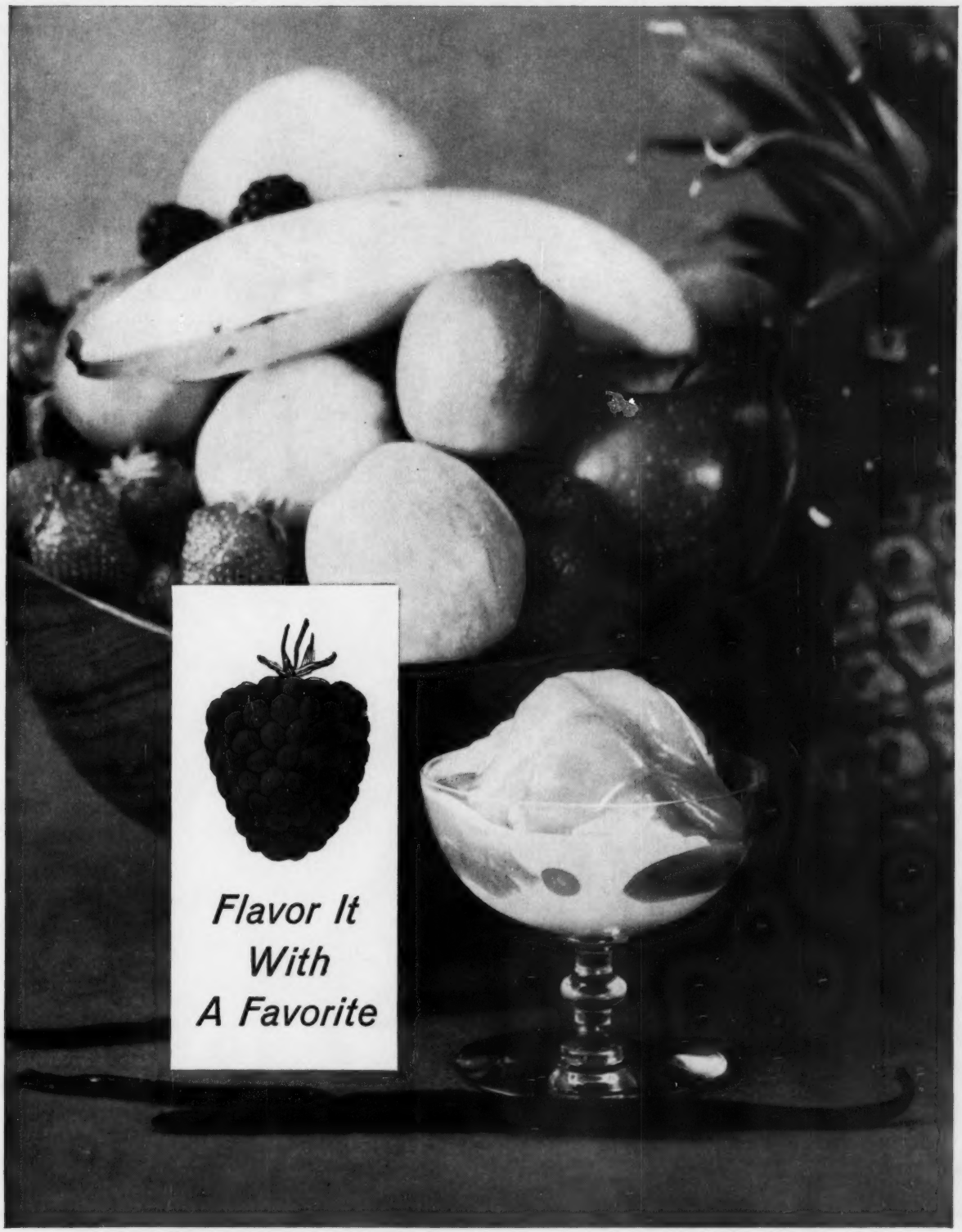

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